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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 7 IN SET 211

HALLICRAFTERS MODELS 1050, A, 1074AT, 1075AT, 1078AT, 1081, A, B, C, D, E, 1085A, B, C, D, E, 1088, A, B, C, D, 1092 (Ch. AJ1200D, AL1200D, AX1200D, AY1200D, AZ1200D, BA1200D)

Hallicrafters Ch. AX1200D, AZ1200D and BA1200D are similar to the chassis covered in Photofact Folder 7, Set 211. A chart showing the models in which these chassis are used is given below.

Chassis	Models
AX1200D	1092
AZ1200D	1081B, 1081D, 1085B, 1085D, 1088B, 1088D
BA1200D	1081C, 1081E, 1085C, 1085E, 1088C

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Chassis AG1200D may be considered as the basic chassis for this series. All other chassis are based on the AG1200D chassis with any one or more of the modifications shown on the following pages. A chart is given below which shows the modifications used in later production of chassis AJ1200D, AL1200D and AY1200D and in all AX1200D, AZ1200D and BA1200D chassis.

Modifications I thru VIII are given on pages 14 and 19 of Photofact Folder 7, Set 211. Modifications IX thru XIV are covered in this Production Change Bulletin.

In addition, a schematic of the 1C1376 and 1E1677 Cascode Tuner, used in Ch. AJ1200D, AL1200D and AY1200D, which was omitted in Photofact Folder 7, Set 211 is given in Fig. 1 in this Production Change Bulletin. For alignment of this tuner refer to Photofact Folder 7, Set 211.

PRODUCTION CHANGES
BULLETIN 81

COMPARISON OF 1200D SERIES CHASSIS

CHASSIS	PIX TUBE SIZE	HEATER CIRCUIT	TUNER TYPE	MODIFICATION USED
AJ1200D Run 3	21" Glass	Transformer	1C1376 Cascode	I, II, IV, VI, IX, X
AL1200D Run 3 Run 4	17" Glass 17" Glass	Series-Parallel Series -Parallel	1C1345 Pentode 1C1345 Pentode	I, II, VII I, VII, IX
AX1200D Run 1	17" Glass	Series-Parallel	1C1345 Pentode	I, II, VII
AY1200D Run 3 Run 4	21" Glass 21" Glass	Transformer Transformer	1E1677 Cascode 1E1677 Cascode	I, II, IV, VI, IX I, II, IV, VI, IX, X
AZ1200D Runs 1, 1A Run 2	21" Glass 21" Glass	Transformer Transformer	1E1380 Cascode 1E1380 Cascode	I, II, IV, VI, VII, IX, XIII I, II, IV, VI, VII, VIII, IX, XIII
BA1200D Run 1 Run 2 Run 3	21" Metal 21" Glass 21" Glass	Transformer Transformer Transformer	1E1483 Cascode 1E1483 Cascode 1E1483 Cascode	I, II, IV, VI, VIII, XI I, II, IV, VI, XI I, II, IV, VI, IX, X, XI, XIV

MODIFICATION IX

LOCATION OF CHANGE	CHANGE MADE
A. Grid Circuit of V11	R49 changed from 22KΩ to 10KΩ.
B. Plate circuit of V11	R50 changed from 220KΩ to 470KΩ.
C. Grid and Cathode Circuit of V11	R52 changed from 1.2Meg to 820KΩ.
D. Plate Circuit of V12	C61 changed from 51MM to 22MMF.
	R62 and R63 were transposed so R62 (3.3KΩ) goes to ground and R63 (1.8KΩ) connects to the junction of C66 and C67.

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MODIFICATION X

LOCATION OF CHANGE	CHANGE MADE
Feedback Circuit from V15 to V13.	C73 (.001MFD) was replaced by either two .01MFD capacitors, in series, or one .0047MFD, 1000V, capacitor.

MODIFICATION XI

To use a 1E1483, 16 position Cascode Tuner, the following changes were made:

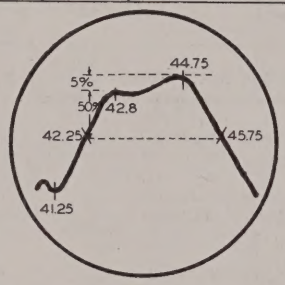
A. The 1E1483 Cascode Tuner is used in place of the 1C1345 Pentode Tuner. A schematic of the 1E1483 tuner is given in Fig. 2. An alignment chart for this tuner is also given in the Production Change Bulletin.

B. The video IF frequency was shifted to the 40MC region. A schematic showing the revised video IF circuit is given in Fig. 9. Video IF alignment of sets using the 40MC IF is identical to sets using the 20MC IF except the following signal generator frequencies should be used in lieu of those given on page 6 of Set 211-7.

Step 1 ..... 45MC
Step 2 ..... 42.8MC
Step 3 ..... 44MC
Step 4 ..... 41.25MC
Step 5 ..... 42.8MC
Steps 6, 7 ..... 44.25MC

The following chart should be used for the overall Video IF response Check.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	44MC (10MC Swp)	41.25MC 42.25MC 43.8MC 44.75MC 45.75MC	Any	Vert. Amp. to point (A). Low side to chassis.		Check for response similar to the figure given below. Response curve should be tilted to compensate for the capacitive coupling of the sweep generator. If necessary retouch A1, A2 and A3 for desired response. A3 affects principally the tilt, A1 affects the 45.75MC marker placement, A2 affects the slope of the curve between 41.25MC and 42.8MC and the placement of the 42.25MC marker.



MODIFICATION XII

To use a type 6AS4 or 6AX4 tube in place of the 12AX4 Damper tube the following changes were made:

A. Heater transformer #52C258 (Mod.IV) is removed and replaced by transformer #52C290.

B. The Damper tube obtains heater voltage from a separate winding on this transformer. The audio output tube obtains heater voltage from a 6.3 volt tap on the primary of the transformer.

C. C83 is deleted.

MODIFICATION XIII

To use a 1E1380 cascode tuner in place of the 1C1345 pentode tuner the following changes were made :

A. The 1C1345 pentode tuner is removed and replaced by the 1E1380 cascode tuner. The 1E1380 tuner does not have terminal lugs on the back, therefore, the wire leads from the tuner must be connected to the correct points in the circuit. The 1E1380 tuner may be used only with 3 3/4" deep chassis (Mod. VII), which have a heater transformer. A schematic of this tuner is given in Fig. 6. An alignment chart is also given in this Production Change Bulletin.

B. R18, in the AGC line and R19, in the B+ line, are not used when this tuner is used.

MODIFICATION XIV

A. A 1000MMF, 500V capacitor was added from the positive terminal of C3A to ground.

B. A shield was placed over the bottom of L18.

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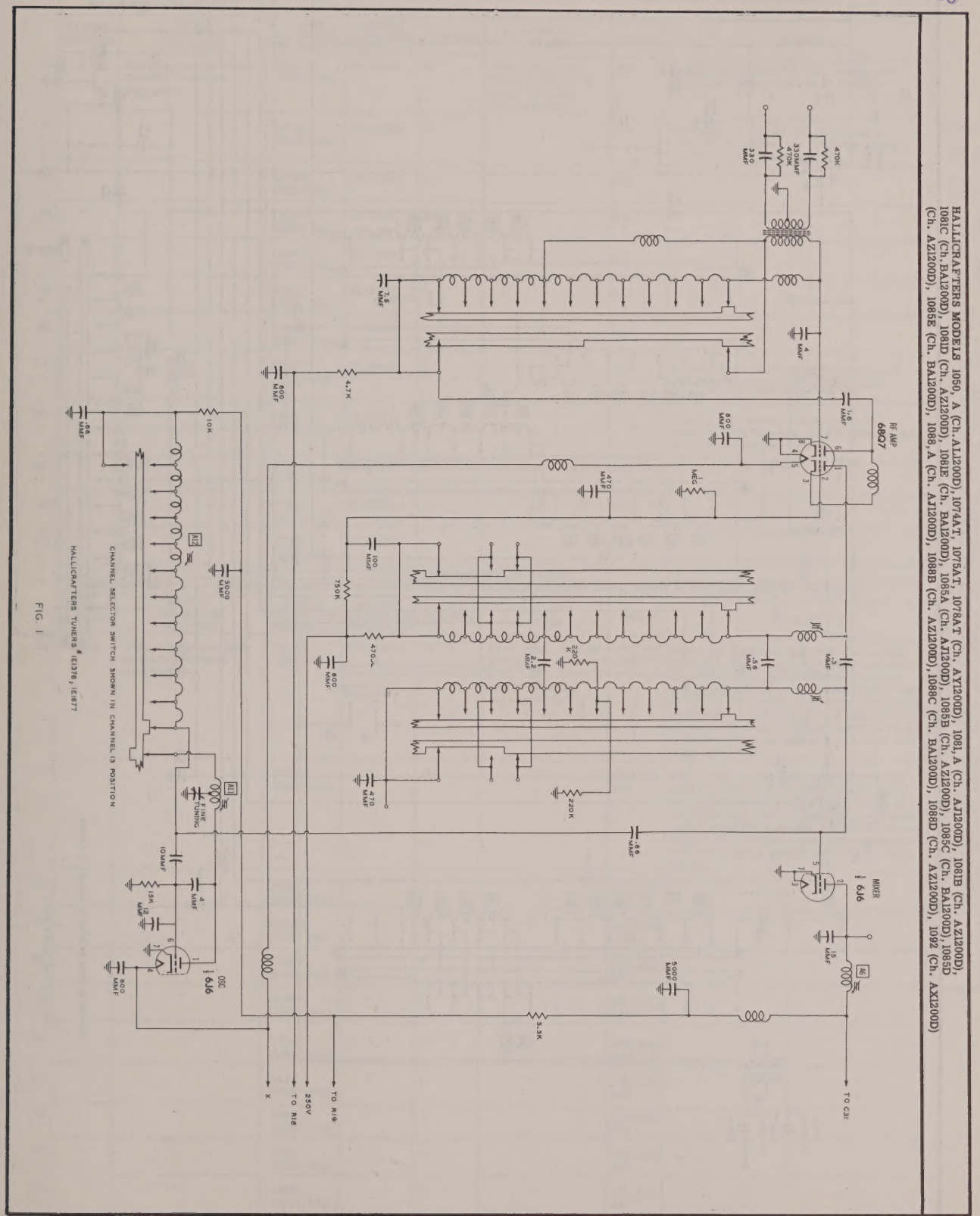
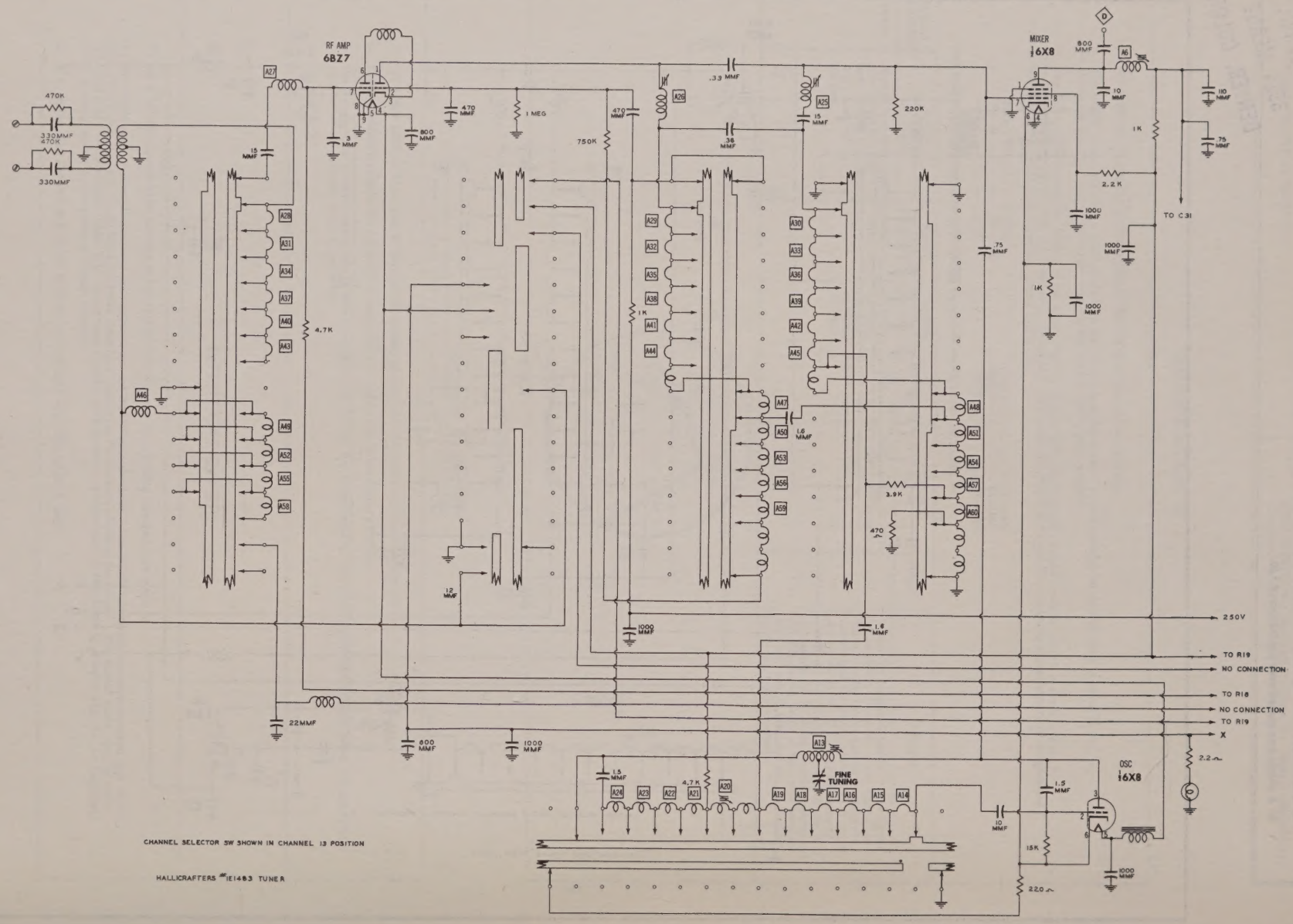


FIG. 1

HALLICRAFTERS TUNERS #IE378, IE877

HALLICRAFTERS MODELS 1050, A (Ch. AL1200D), 1074AT, 1075AT, 1078AT (Ch. AY1200D), 1081, A (Ch. AJ1200D), 1081B (Ch. AZ1200D), 1081C (Ch. BA1200D), 1081D (Ch. AZ1200D), 1081E (Ch. BA1200D), 1085A (Ch. AJ1200D), 1085B (Ch. AZ1200D), 1085C (Ch. BA1200D), 1085D (Ch. AZ1200D), 1085E (Ch. BA1200D), 1088,A (Ch. AJ1200D), 1088B (Ch. AZ1200D), 1088C (Ch. BA1200D), 1088D (Ch. AZ1200D), 1092 (Ch. AZ1200D)



CHANNEL SELECTOR SW SHOWN IN CHANNEL 13 POSITION

HALLICRAFTERS #IE1483 TUNER

FIG. 2

ALIGNMENT INSTRUCTIONS FOR IE1483 TUNER

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Remove the dummy converter and replace the original 6J6 in its socket.
Connect the negative side of a 1½ volt battery to the ungrounded side of C33. Connect the positive side to chassis.
During oscillator alignment the use of two marker generators is required. Generator #1 (IF) is loosely coupled to the detector circuit (Fig. 8) by clipping the high side over the germanium diode in the detector circuit.
Connect the low side to chassis. Marker generator #2 (RF) is loosely coupled to the antenna input by clipping the high side to the sweep generator lead. If the sweep generator has a built-in marker it will be used for generator #2.

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OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Fig. 3	Thru antenna matching network to antenna terminals.	213MC (10MC Swp)	211.25MC	13	Vert. Amp. thru detector (Fig. 4) to point D. Low side to chassis.	A13	Adjust A13 to make 45.75MC marker and RF video marker coincide on response curve.
17.	"	"	207 MC (10MC Swp)	205.25MC	12	"	A14	Compress or expand coil increment to make 45.75 marker and RF video marker coincide on response curve.
18.	"	"	201MC (10MC Swp)	199.25MC	11	"	A15	"
19.	"	"	195MC (10MC Swp)	193.25MC	10	"	A16	
20.	"	"	189MC (10MC Swp)	187.25MC	9	"	A17	"
21.	"	"	183MC (10MC Swp)	181.25MC	8	"	A18	"
22.	"	"	177MC (10MC Swp)	175.25MC	7	"	A19	"
23.	"	"	85MC (10MC Swp)	83.25MC	6	"	A20	Adjust A20 to make 45.75MC marker and RF video marker coincide on response curve.
24.	"	"	79MC (10MC Swp)	77.25MC	5	"	A21	Compress or expand coil increment to make 45.75MC marker and RF video marker coincide on response curve.
25.	"	"	69MC (10MC Swp)	67.25MC	4	"	A22	"
26.	"	"	63MC (10MC Swp)	61.25MC	3	"	A23	"
27.	"	"	57MC (10MC Swp)	55.25MC	2	"	A24	"

RF AND MIXER ALIGNMENT

All connections for RF and Mixer alignment are idenical to those for Oscilliator alignment above, except marker generator #2 is not used.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
28.	Fig. 3	Thru antenna matching network to antenna terminals	213MC (10MC Swp)	45.75MC	13	Vert. Amp. thru detector (Fig. 4) to point D. Low side to chassis.	A25, A26 A27	Adjust for maximum gain with steep sides similar to Fig. 5. A25 is adjusted for maximum band gain, A26 is adjusted for slope and position of skirts, A27 controls the shape of the flat top portion of the curve. Normally no further alignment of RF and mixer circuit is required. Check response curve on other channels, and if unsatisfactory proceed with steps 29 thru 39.
29.	"	"	207MC (10MC Swp)	"	12	"	A28, A29 A30	Adjust coil incremental loops for response curve similar to Fig. 5. The mixer grid coil increments are adjusted for maximum mid-band gain, the RF plate coil increments are adjusted for slope and position of skirts, the RF grid coil increments adjustments control the shape of the flat-top portion of the curve.
30.	"	"	201MC (10MC Swp)	"	11	"	A31, A32, A33	"
31.	"	"	195MC (10MC Swp)	"	10	"	A34, A35, A36	"
32.	"	"	189MC (10MC Swp)	"	9	"	A37, A38, A39	"
33.	"	"	183MC (10MC Swp)	"	8	"	A40, A41, A42	"
34.	"	"	177MC (10MC Swp)	"	7	"	A43, A44, A45	"
35.	"	"	85MC (10MC Swp)	"	6	"	A46, A47, A48	"
36.	"	"	79MC (10MC Swp)	"	5	"	A49, A50, A51	"
37.	"	"	69MC (10MC Swp)	"	4	"	A52, A53, A54	"
38.	"	"	63MC (10MC Swp)	"	3	"	A55, A56, A57	"
39.	"	"	57MC (10MC Swp)	"	2	"	A58, A59, A60	"

Repeat Step 25 as final adjustment for Channel 13.

HALLICRAFTERS MODELS 1050, A (Ch. AL1200D), 1074AT, 1075AT, 1078AT (Ch. AY1200D), 1081, A (Ch. AJ1200D), 1081B (Ch. AZ1200D), 1081C (Ch. BA1200D), 1081D (Ch. AZ1200D), 1081E (Ch. BA1200D), 1085A (Ch. AJ1200D), 1085B (Ch. AZ1200D), 1085C (Ch. BA1200D), 1085D (Ch. AZ1200D), 1085E (Ch. BA1200D), 1088, A (Ch. AZ1200D), 1088B (Ch. AZ1200D), 1088C (Ch. BA1200D), 1088D (Ch. AZ1200D), 1092 (Ch. AX1200D)

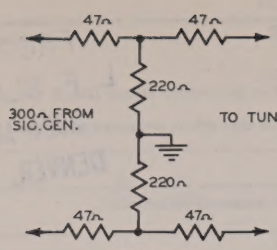

FIG. 3

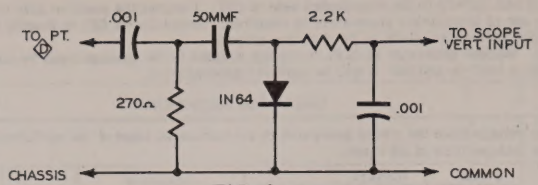

FIG. 4

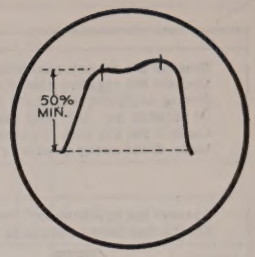

FIG. 5

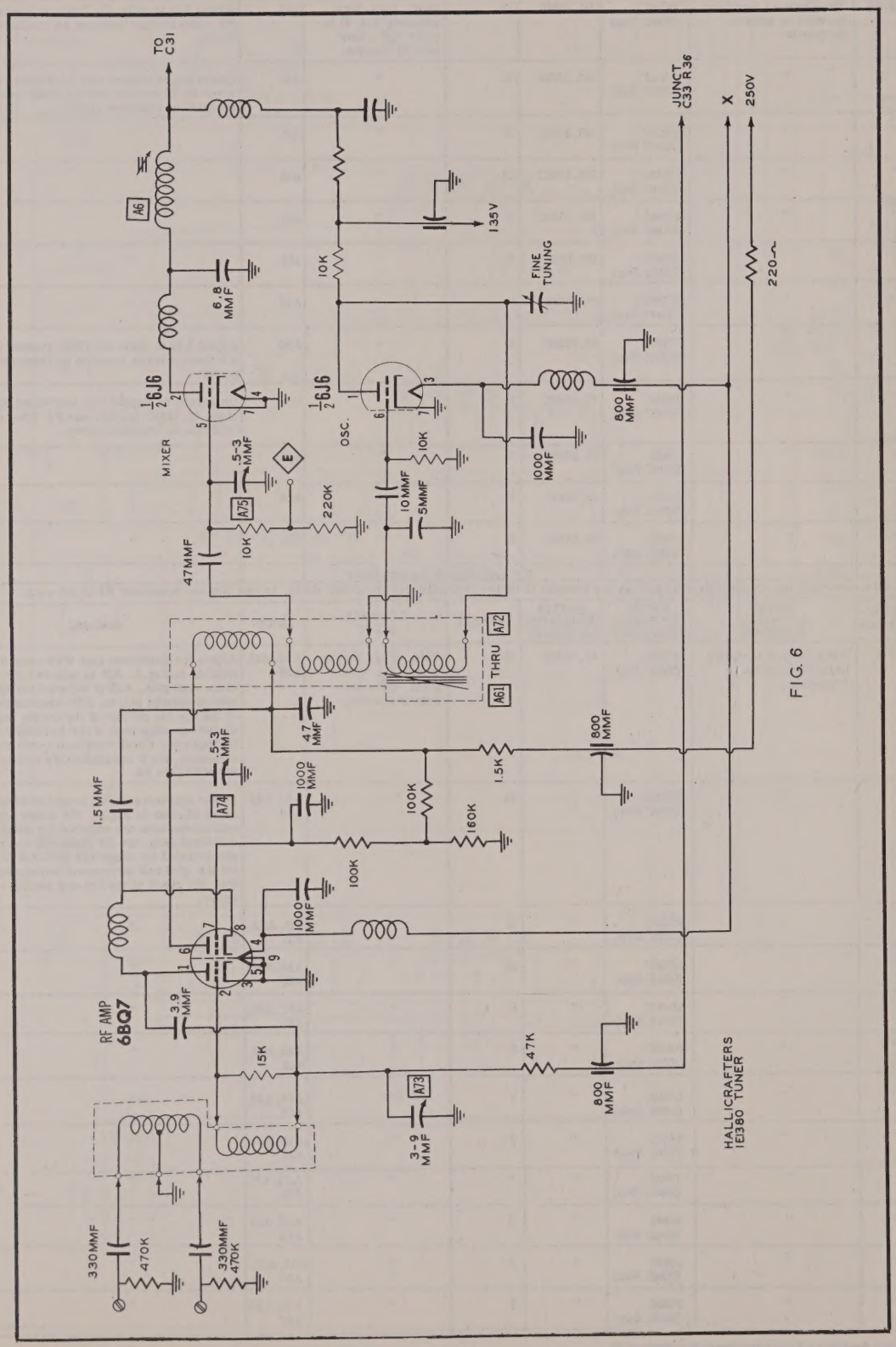

FIG. 6

ALIGNMENT INSTRUCTIONS FOR IE1380 TUNER

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OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through the hole as the channel switch is turned to each channel.
Connect the bias battery under Video IF Alignment.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
37.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A61	Adjust to place sound marker in notch as in Fig. 7. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A62	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A63	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A64	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A65	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A66	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A67	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A68	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A69	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A70	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A71	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A72	

RF AND MIXER ALIGNMENT

Remove 3 volt battery as used under oscillator alignment. Connect the negative lead of a 1½ volt battery to the ungrounded side of C33.
Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
38.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (E). Low side to chassis.	A73, A74, A75	Adjust for response curve similar to Fig. 8.
39.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 8. If markers fall below 70% on any channel make compromise adjustments of A73, A74, and A75 with channel switch set to that channel, then check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

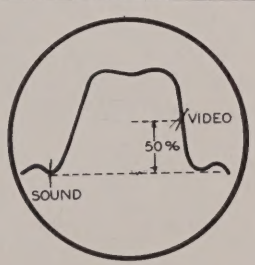

FIG. 7

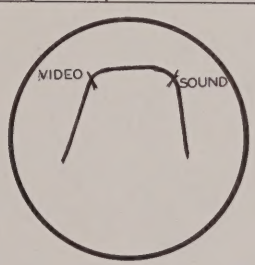

FIG. 8

HALLICRAFTERS MODELS 1050, A (Ch. A1J200D), 1074AT, 1075AT, 1078AT (Ch. AYJ200D), 1081, A (Ch. AJJ200D), 1081B (Ch. AZJ200D), 1081C (Ch. BAJ200D), 1081D (Ch. AZJ200D), 1081E (Ch. BAJ200D), 1085A (Ch. AJJ200D), 1085B (Ch. AZJ200D), 1085C (Ch. BAJ200D), 1085D (Ch. AZJ200D), 1085E (Ch. BAJ200D), 1088, A (Ch. AJJ200D), 1088B (Ch. AZJ200D), 1088C (Ch. BAJ200D), 1088D (Ch. AZJ200D), 1092 (Ch. AXJ200D)

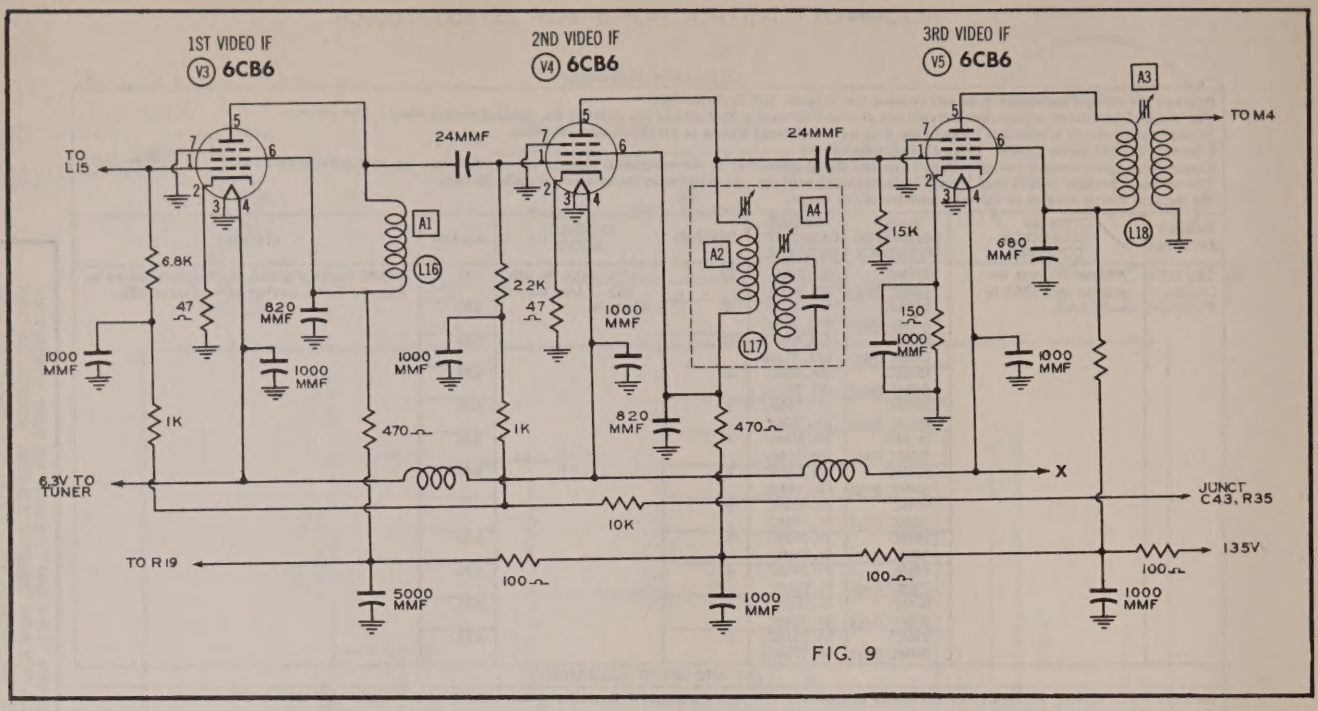
1ST VIDEO IF
V3 6CB6
2ND VIDEO IF
V4 6CB6
3RD VIDEO IF
V5 6CB6
TO L15
24MMF
24MMF
A1
A2
A3
A4
L16
L17
L18
TO M4
6.8K
47
820 MMF
1000 MMF
1000 MMF
1K
470
22K
47
1000 MMF
1000 MMF
1K
820 MMF
470
15K
150
1000 MMF
680 MMF
1000 MMF
X
6.3V TO TUNER
10K
JUNCT C43, R35
TO R19
100
100
100
135V
5000 MMF
1000 MMF
1000 MMF

FIG. 9

PHOTOFACT* Folder

ADMIRAL
CHASSIS MODELS 22F2, 22M2, 22P2

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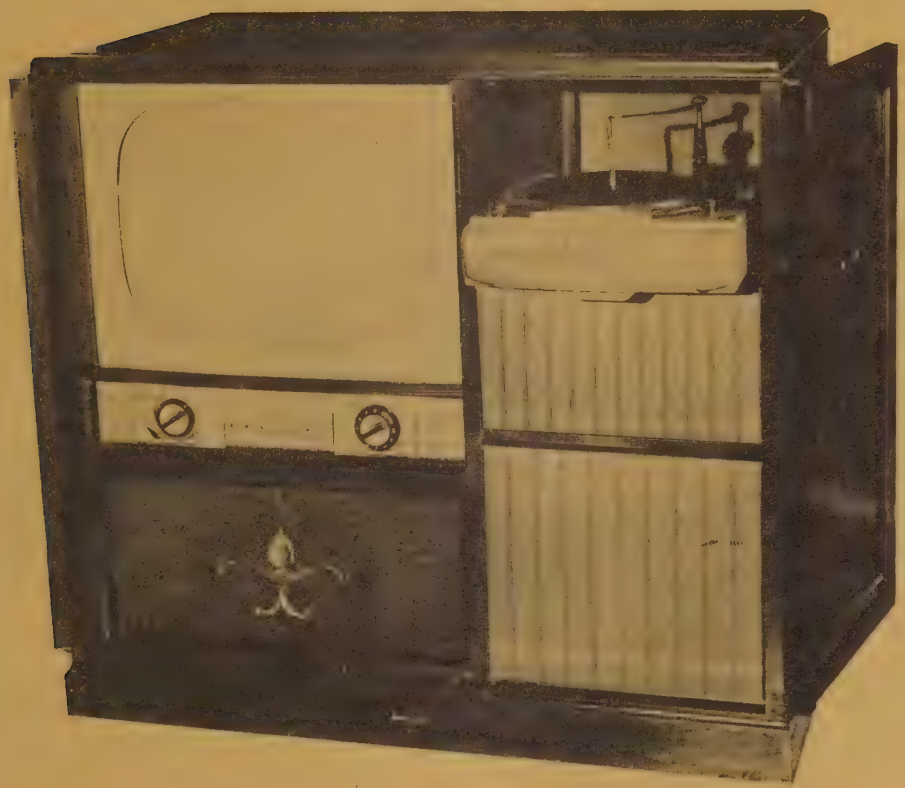

MODEL 322DX16A

ADMIRAL
CHASSIS MODELS 22F2, 22M2, 22P2

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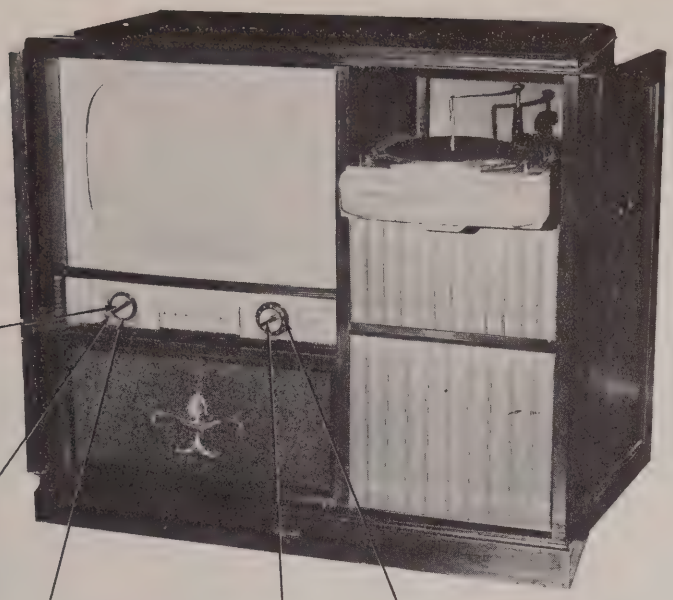
DATE 11–53 SET 222 FOLDER 2

PHOTOFACT* Folder
*TRADE MARK

ADMIRAL
CHASSIS MODELS 22F2, 22M2, 22P2



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ADMIRAL MODEL 322DX16A

NAME	Admiral	MODELS	CHASSIS	RADIO	RECORD CHANGER
		122DX12	22F2		
		222DX15B	22M2		
		222DX16B	22M2		
		222DX17B	22M2		
		222DX27B	22M2		
		322DX16A	22P2	Built-in AM Radio	RC600
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Ill.				
TYPE SET	TV-AM-Phono Combination Receiver				
TUBES	Twenty-four				
POWER SUPPLY	110-120 Volts AC-60 Cycle		RATING 1.7 Amp. @ 117 Volts AC		
TUNING RANGE-	Channels 2 thru 13, Video IF 25.75MC, Sound IF 21.25MC (Intercarrier) AM Radio 540-1620KC, AM IF 455KC				

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FOR SERVICE INFORMATION ON RECORD CHANGER, SEE MODEL RC600, PHOTOFACT SET 218, FOLDER 2.

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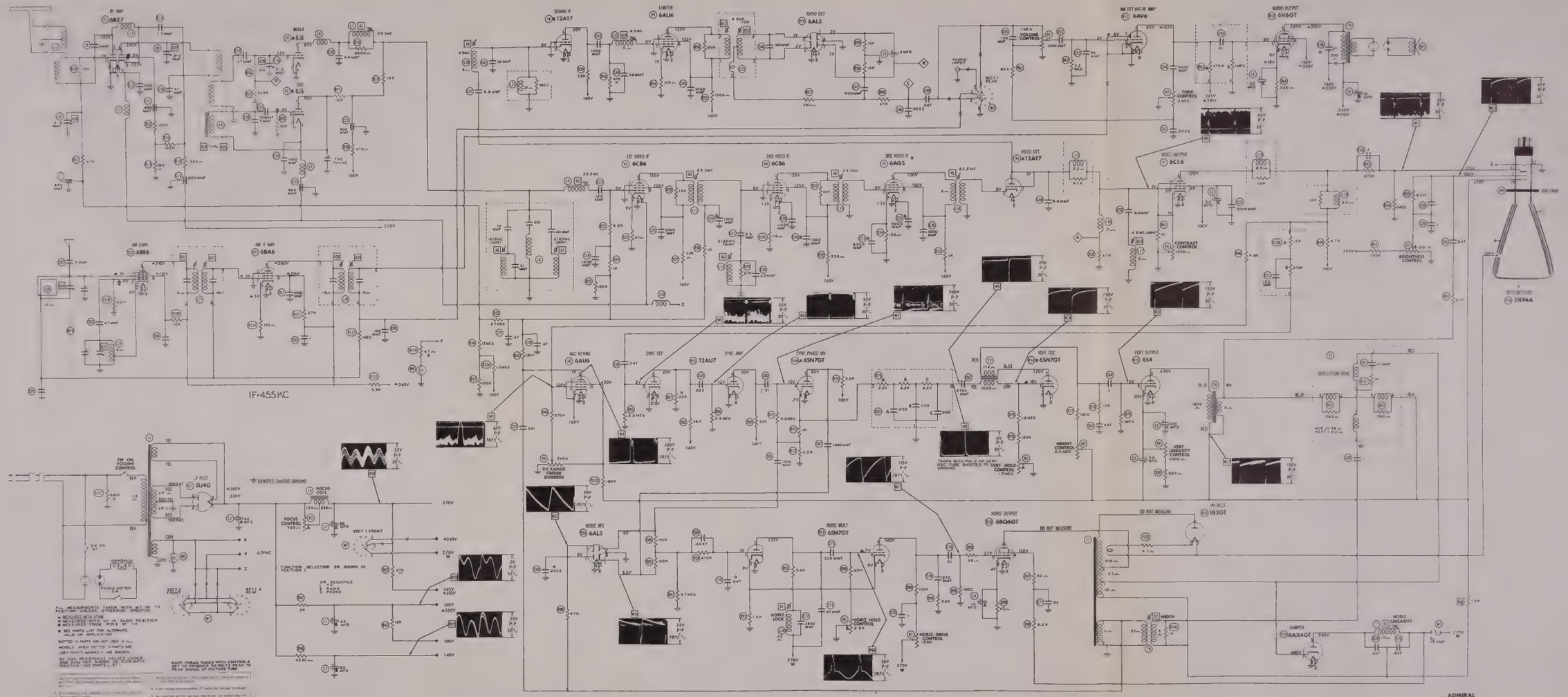
DATE 11 -53 SET 222 FOLDER 2

ADMIRAL
CHASSIS MODELS 22F2, 22M2, 22P2


RF AMP V1 6BZ7
MIXER V2 6J6
OSC V3 6J6
SOUND IF V18 12AT7
LIMITER V5 6AU6
RATIO DET V19 6AL5
AM DET AVC/AF AMP V11 6AV6
AUDIO OUTPUT V18 6V6GT
1ST VIDEO IF V7 6CB6
2ND VIDEO IF V4 6CB6
3RD VIDEO IF V5 6AG5
VIDEO DET V6 1/2AT7
VIDEO OUTPUT V7 6CL6
AM CONV V20 6BE6
AM IF AMP V21 6BA6
IF-455KC
AGC &TYING V9 6AU6
SYNC SEP
SYNC AMP V3 12AU7
SYNC PHASE INV V16A 6SN7GT
VERT OSC V16B 6SN7GT
VERT OUTPUT V10 6S4
HORIZ AFC V8 6AL5
HORIZ MULT V9 6SN7GT
HORIZ OUTPUT V12 6BQ6GT
DO NOT MEASURE
HV RECT V17 1B3GT
DAMPER V13 6AX4GT
HORIZ LINEARITY
ION TRAP
V14 2EP4A
SW ON VOLUME CONTROL
V RECT V15 5U4G
PHONO MOTOR
DENOTES CHASSIS GROUND
FOCUS COIL
FOCUS CONTROL
SECT 1 FRONT
SECT 2 REAR
FUNCTION SELECTOR SW SHOWN IN
SW SEQUENCE
1 TV
2 RADIO
3 PHONO
DX RANGE FINDER
HEIGHT CONTROL
VERT LINEARITY CONTROL
VERT HOLD CONTROL
HORIZ HOLD CONTROL
HORIZ LOCK
HORIZ DRIVE CONTROL
WIDTH
TONE CONTROL
VOLUME CONTROL
CONTRAST CONTROL
BRIGHTNESS CONTROL
DEFLECTION YOKE
HOR. P-P 38 VERT. P-P 53
ALL MEASUREMENTS TAKEN WITH SET IN TV POSITION UNLESS OTHERWISE SPECIFIED
A MEASURED WITH VTVM
B MEASURED FROM PIN 1 OF V11
C MEASURED FROM PIN 8 OF V11
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED W PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED W PARTS ARE USED MOUNTS MARKED X ARE SHOWN
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM (SEE PARTS LIST)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
TAKEN WITH MOD 2 OF VERT OSCILLATOR SHUNTED TO VERT HOLD CONTROL 2 MEG

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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CHASSIS MODELS 22F2, 22M2, 22P2

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CHASSIS MODELS 22F2, 22M2, 22P2

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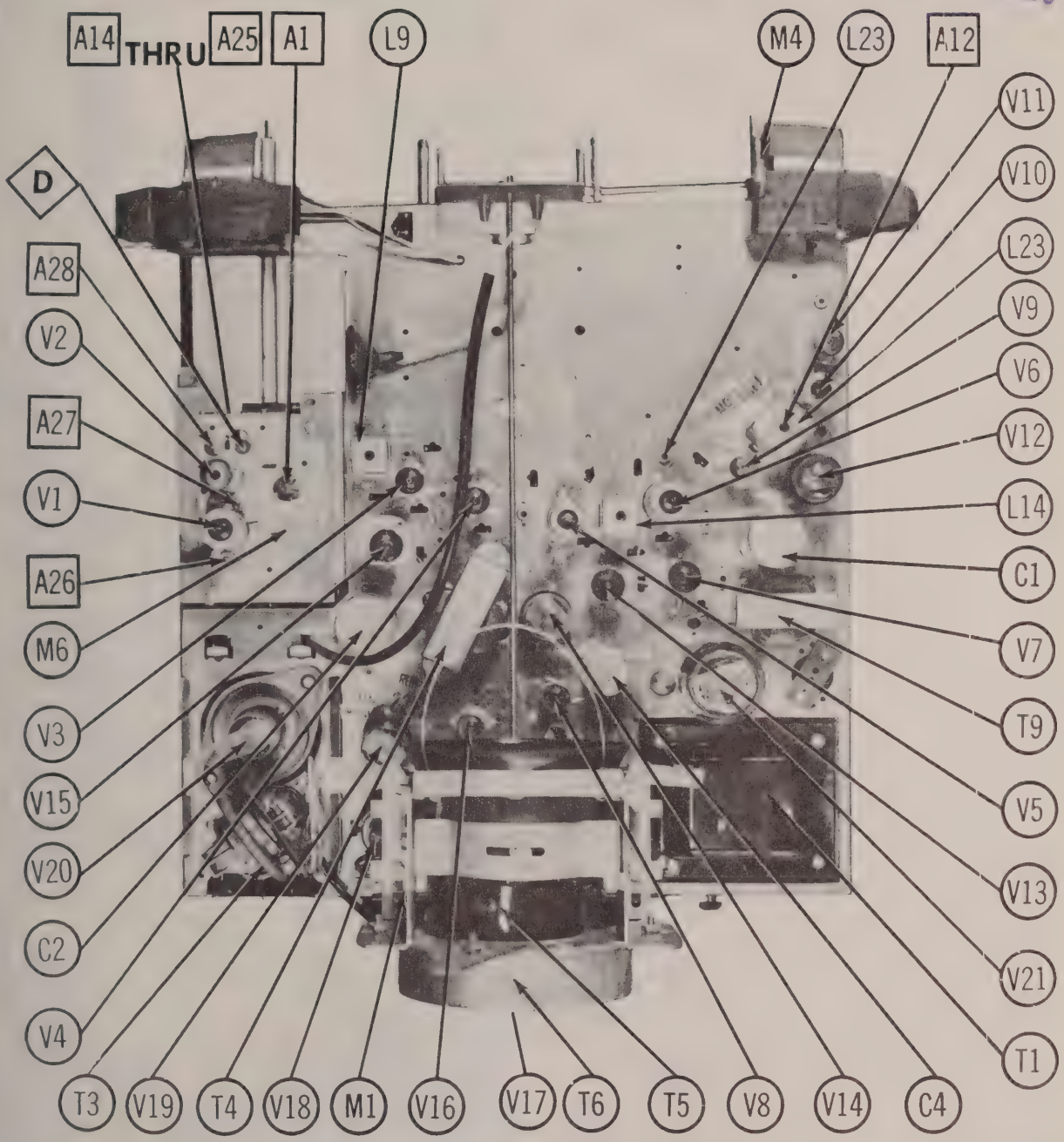

CHASSIS TOP VIEW

SET 222 FOLDER 2

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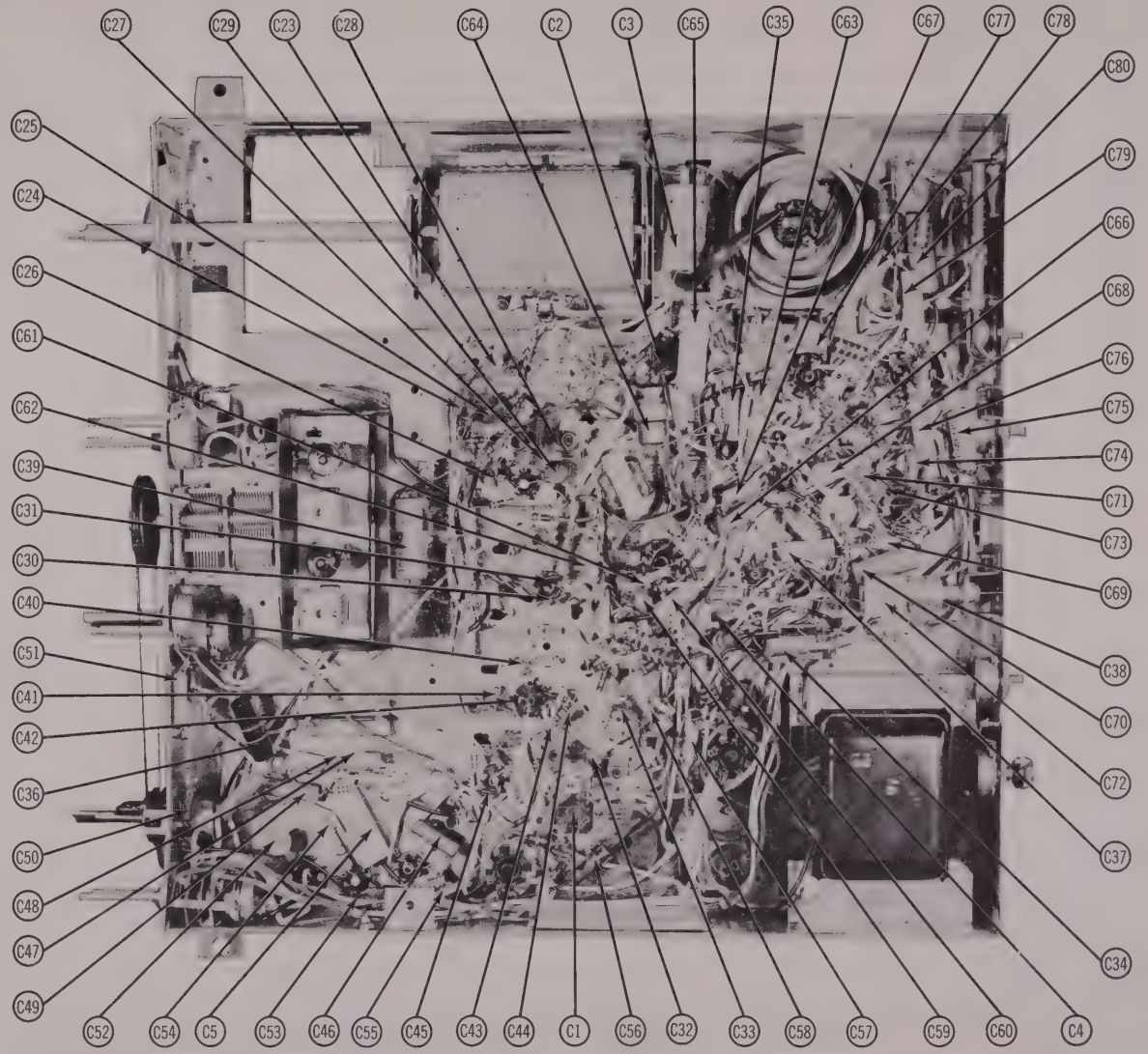

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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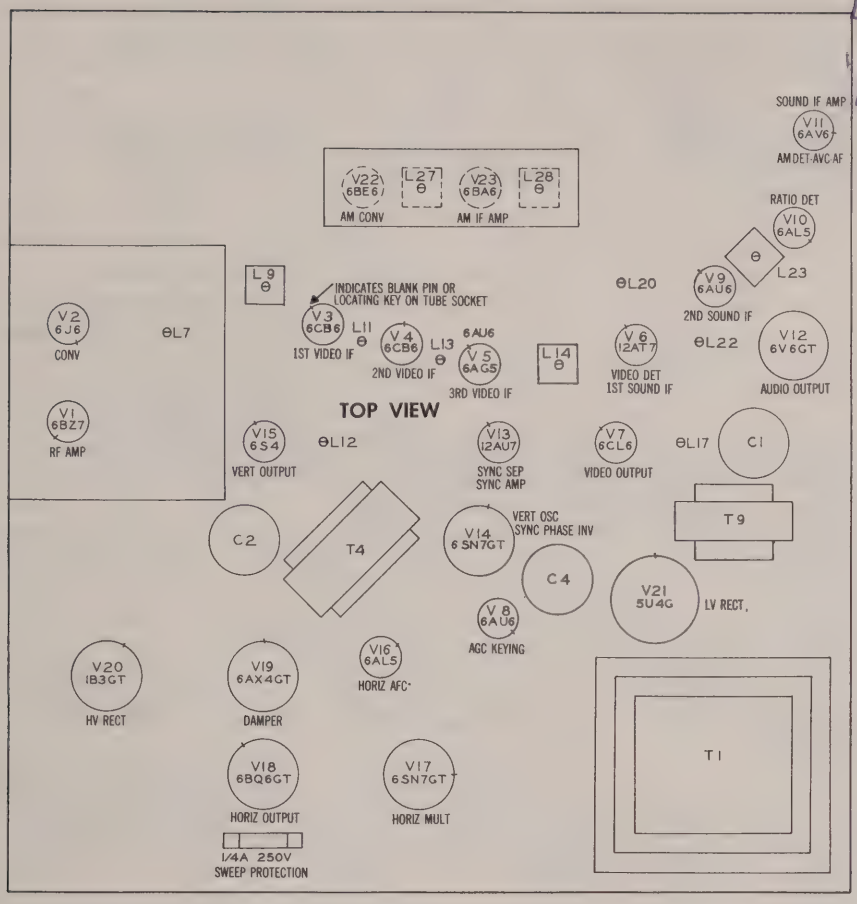

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V21

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V24
Has pic, no sound - V6, V9, V10, V11, V12
Overloaded picture - V8

SYNC FAILURE
No vert. sync - V14, V15
No horiz. sync - V14, V16, V17
No vert. or horiz. sync - V13, V14

SWEEP FAILURE
No raster, has sound - V17, V18, V19, V20, V24, Fuse (M1)
No vertical deflection - V14, V15
Poor vert. linearity or foldover - V14, V15
Poor horiz. linearity or foldover - V17, V18, V19
Narrow picture - V17, V18, V19, V20, V21
Vert. off freq. - V14, V15
Horiz. off freq. - V14, V16, V17

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 4.5 volt bias supply to the ungrounded side of C39. Connect the positive lead to chassis.
Set the contrast control to minimum.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.3MC (unmod)	Any unused high channel	DC probe thru decoupling filter (fig. 1) to point (A). Common to chassis.	A1, A2, A3	Adjust for maximum deflection. Alternate generator to maintain approximately 1 volt at VTVM.
2.	"	"	22.3MC	"	"	A4	"
3.	"	"	23.5MC	"	"	A5	"
4.	"	"	21.25MC	"	"	A6	Adjust for minimum deflection
5.	"	"	27.25MC	"	"	A7	Use 1.5 volt bias. Adjust for MINIMUM deflection.
6.	"	"	19.75MC	"	"	A8	"
7.	"	"	25.3MC	"	"		Use 4.5 volt bias. Readjust A1, A2, and A3 for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Connect 4.5 volt bias battery and set contrast control as under Video IF Alignment.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.25MC 22.0MC 24.5MC 25.0MC 25.75MC	Any unused high channel	Vertical Amp. thru decoupling filter (fig. 1) to point (A). Low side to chassis.		Check for response curve similar to fig. 2. If necessary retouch A1 thru A5 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to pin 1 (plate) of 12AT7 (V6A). Low side to chassis.	4.5MC (unmod)	Any	DC probe to point (B). Common to chassis.	A9, A10, A11	Adjust for maximum deflection. Alternate generator to maintain 1 volt at VTVM.
10.	"	"	"	"	Dc probe to point (C). Common to chassis.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to pin 1 (plate) of 12AT7 (V6A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis	A9, A10, A11	Disconnect stabilizer capacitor C5. Adjust for curve of maximum amplitude and symmetry as in Fig. 3.
10.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A12	Reconnect stabilizer capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Connect a 10MMF capacitor from pin 6 of V7 to pin 8 of V6B.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.01MFD	High side to pin 1 (plate) of 12AT7 (V6A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B). Common to chassis.	A13	Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A14	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A15	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A16	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A17	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A18	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A19	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A20	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A21	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A22	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A23	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A24	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A25	

ALIGNMENT INSTRUCTIONS (cont)

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point D. Low side to chassis.	A26, A27 A28	Adjust for response curve similar to Fig.6.
14.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 6. If markers fall below 70% on any channel make slight compromise adjustments of A26, A27 and A28 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

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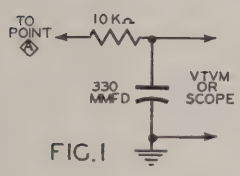


FIG.1

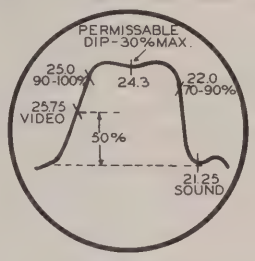


FIG.2

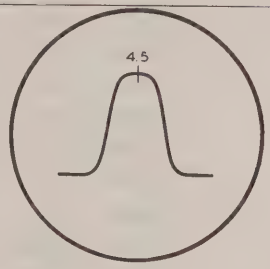


FIG.3

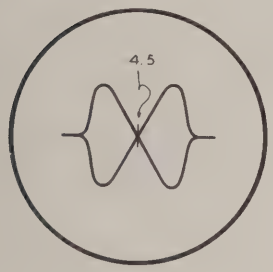


FIG. 4

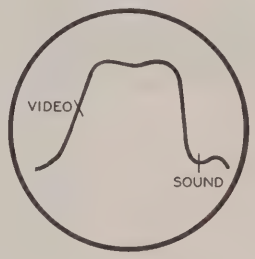


FIG. 5

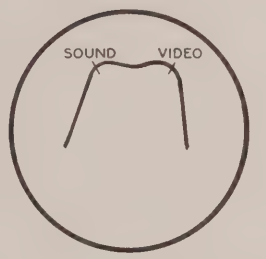
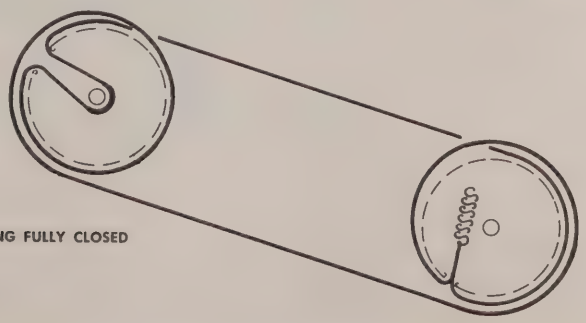


FIG. 6

RADIO ALIGNMENT

Turn function switch to "radio" position.
Turn tone control fully clockwise.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
15.	.1MFD	High side to stator plates of antenna section of tuning gang. Low side to chassis.	455KC (400∿ Mod)	Radio	Tuning gang fully open	Across voice coil	A29, A30, A32	Adjust for maximum deflection.
16.	"	"	1620KC	"	"	"	A33	"
17.		Loop	1400KC	"	Tune to 1400KC signal.	"	A34	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

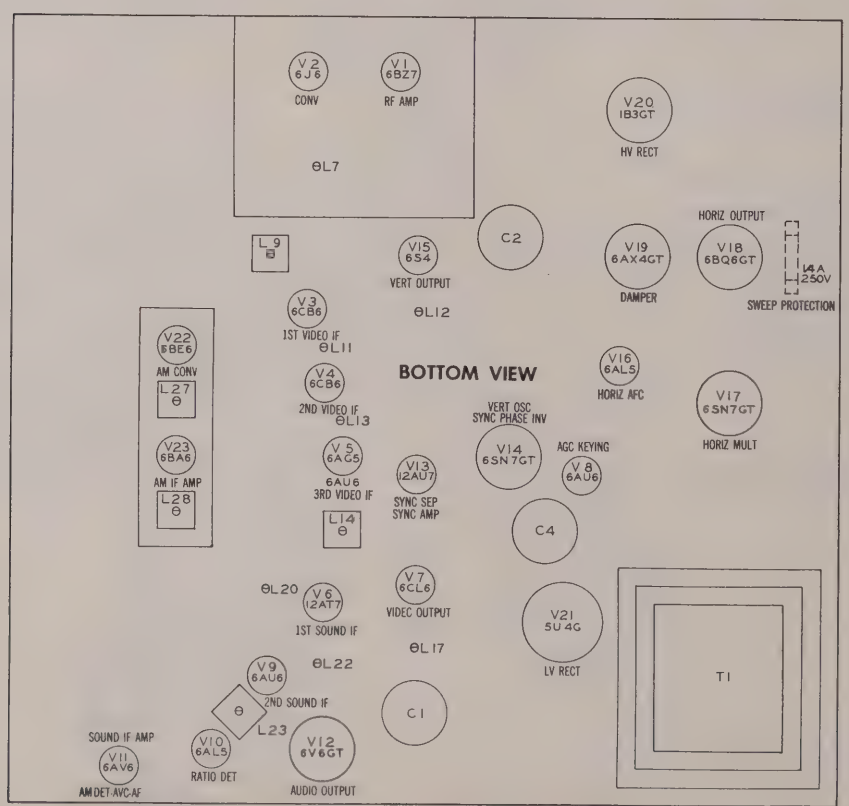

TUNING GANG FULLY CLOSED

DRIVE CORD STRINGING

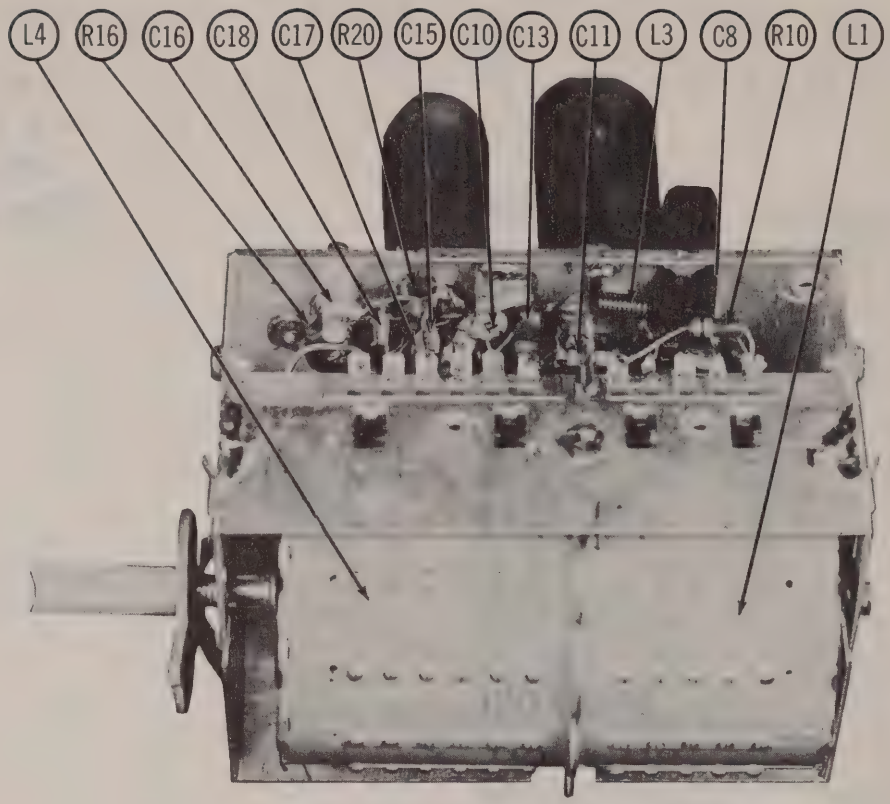
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	INF	3Meg	0Ω	.1Ω	0Ω	■1. 8KΩ	■170KΩ	INF	0Ω
V 2	6J6	■18KΩ	■18KΩ	.1Ω	0Ω	230KΩ	10K Ω	0Ω		
V 3	6CB6	160KΩ	47Ω	.1Ω	0Ω	■4. 5KΩ	■4. 5KΩ	0Ω		
V 4	6CB6	150KΩ	68Ω	.1Ω	0Ω	■4. 5Ω	■4. 5Ω	0Ω		
V 5	6AG5	. 4Ω	0Ω	.1Ω	0Ω	■4KΩ	■4KΩ	150Ω		
V 6	12AT7	4. 7KΩ	4. 7KΩ	. 3Ω	.1Ω	.1Ω	■33KΩ	0Ω	10Ω	0Ω
V 7	6CL6	80Ω	4. 7KΩ	■21KΩ	0Ω	.1Ω	■8KΩ	80Ω	■21KΩ	4. 7KΩ
V 8	6AU6	■14. 5K	■3KΩ	0Ω	.1Ω	300KΩ	▲180KΩ	■3KΩ		
V 9	6AU6	470KΩ	0Ω	.1Ω	0Ω	■4KΩ	■4KΩ	120Ω		
V 10	6AL5	10KΩ	10KΩ	.1Ω	0Ω	INF	0 Ω	INF		
V 11	6AV6	3. 3meg	0Ω	.1Ω	0Ω	†INF #2meg	0Ω	■470KΩ		
V 12	6V6GT	INF	.1Ω	■1. 4KΩ	■3KΩ	1meg	900Ω	0Ω	330Ω	
V 13	12AU7	■35KΩ	2. 2meg	0Ω	.1Ω	.1Ω	■37KΩ	2. 2meg	0Ω	
V 14	6SN7GT	1. 6meg	▲2. 4meg	0Ω	8. 2meg	■25KΩ	3. 2KΩ	.1Ω	0Ω	
V 15	6S4	INF	1. 5KΩ	INF	0Ω	.1Ω	1meg	INF	INF	▲2KΩ
V 16	6AL5	4. 8meg	4. 8meg	.1Ω	0Ω	47KΩ	0Ω	47KΩ		
V 17	6SN7GT	5. 2meg	■6KΩ	1. 5KΩ	130KΩ	■140KΩ	1. 5KΩ	.1Ω	0Ω	
V 18	6BQ6GT	INF	0Ω	INF	■8. 5KΩ	1meg	1meg	.1Ω	47Ω	TOP CAP ▲27Ω
V 19	6AX4GT	750KΩ	INF	460KΩ	INF	■440Ω	650KΩ	.1Ω	0Ω	
V 20	1B3GT	PINS 1-8 HAVE INF RESISTANCE								TOP CAP ▲627Ω
V 21	5U4G	INF	40KΩ	40KΩ	26Ω	INF	24Ω	40KΩ	40KΩ	
V 22	6BE6	22KΩ †INF	.4Ω	#.1Ω	0Ω	■#5.4KΩ	■#15KΩ	#2meg †INF		
V 23	6BA6	#2meg	0Ω	#.1Ω	0Ω	■#5.4KΩ	■#32KΩ	150Ω		
V 24	21EP4A	.1Ω	■50KΩ	Pin 10 ▲1. 2KΩ	Pin 11 ■290KΩ	Pin 12 0Ω				

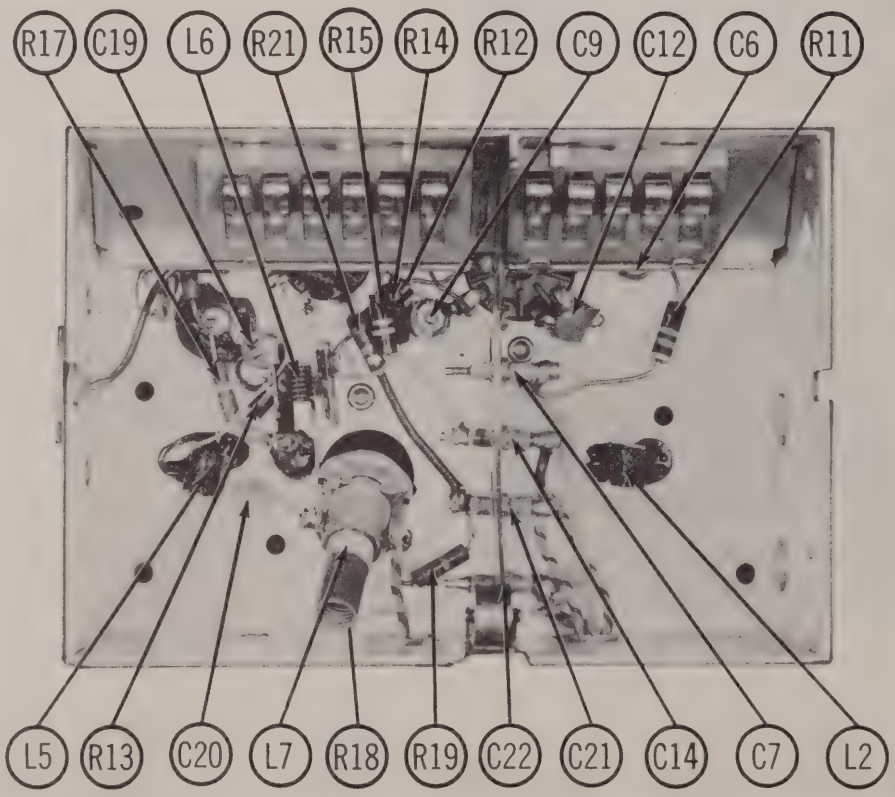
■MEASURED FROM PIN 2 OF V21.
▲MEASURED FROM PIN 3 OF V19.
†MEASURED IN TV POSITION
#MEASURED IN RADIO POSITION



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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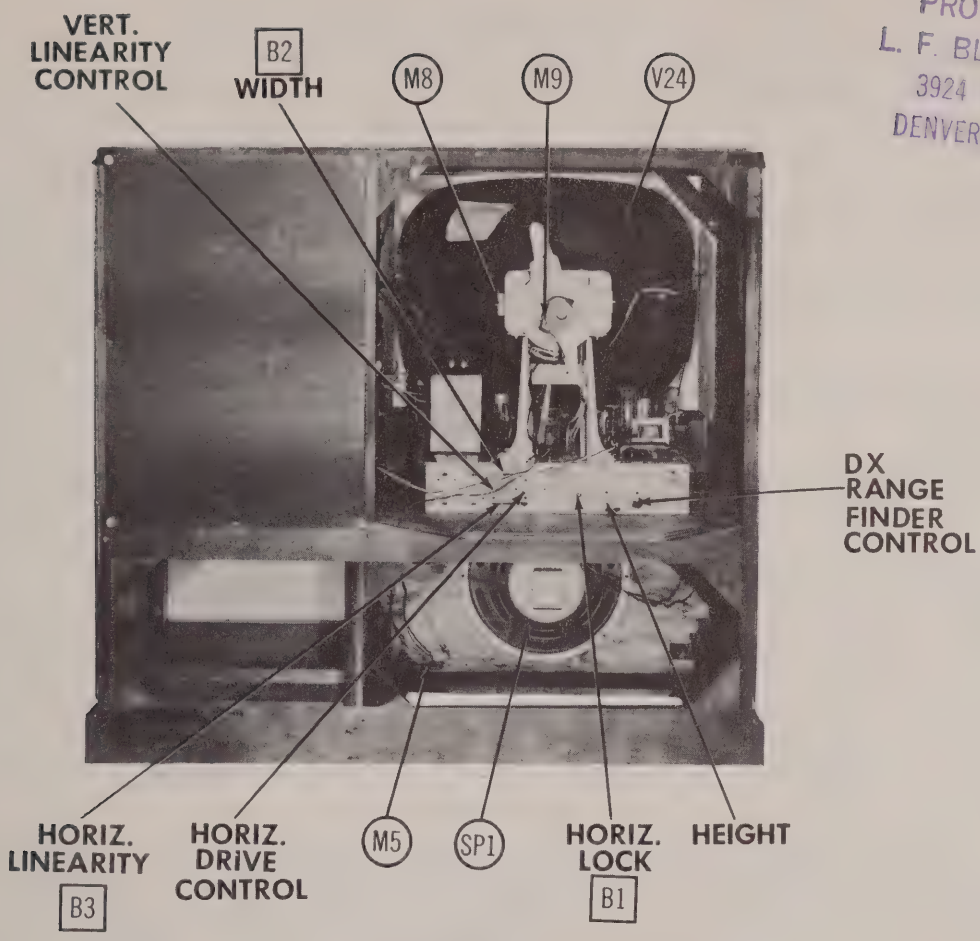


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably a test pattern.
   Set the DX range finder control as near the "zero" position as possible consistent with satisfactory pictures.
2. Set brightness control below average setting. Turn contrast control and horizontal hold controls fully counter clockwise.
3. Turn the horizontal drive control fully clockwise.
4. Turn horizontal lock slug (B1) clockwise until picture loses sync. It may be necessary to switch off channel momentarily for picture to lose sync.
5. Turn B1 slowly counter clockwise until picture just falls into sync.
6. Switch to an unused channel.
   If vertical white lines appear near center of screen slowly rotate the horizontal drive control counter clockwise until the white lines just disappear.
7. If in step 6 the horizontal drive control was readjusted tune in a station and repeat steps 4 and 5.
8. To check for satisfactory operation slowly rotate the horizontal hold control in either direction while interrupting the signal by switching off channel, then back. The picture should fall into sync through at least half of the range of the horizontal hold control. Adjust the width control slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP
See "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V17, V18, V19 and V21. Check adjustment of horiz. drive control, B2 and B3. Check waveform at W17.

If Satisfactory	If Unsatisfactory
Check C77, C78, C79, C80, T3, T5A, R97, R98, R99 and other associated circuit components.	Check C73, C74, C75, C76, R89, R90, R94, R91 and other associated components.

DRIVE LINES

Check adjustment of horiz. drive control. Substitute V17, V18 and V19. Check R89, R7, C74, C75, C76, C78, C79, T3 and T5A.

COMPRESSED LEFT SIDE

Check by substitution V17, V18 and V19. Check adjustment B2 and B3. Check T3, T5A and other associated components.

FOLDS

Check by substitution V17, V18 and V19. Check T3, T5A and other components associated with the horizontal output stage.

XMAS TREE EFFECT

Substitute V17. Check C71, C72, C73, L24 and other components associated with V17.

VERTICAL

LOSS OF SWEEP

Check by substitution V14 and V15. Check waveform at W11.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R84 and other associated components.	Check R76, R77, R78, R79, R75, C63, C64, T2 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V14 and V15. Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V14 and V15. Check R8, R77, R84, C63, C64 and other associated components.

COMPRESSED AT TOP

Check by substitution V14 and V15. Check C2C, C3, T4 and T5B.

FOLDS

Substitute V14 and V15. Check associated circuit components.

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V17 and V16. Check waveform W15.

If Satisfactory	If Unsatisfactory
Check C66, C67 and components associated with V17.	Check C68 and R88.

CRITICAL HOLD

Check by substitution V17 and V16. Check components associated with these stages.

HORIZONTAL FLUTTER

Check horiz. AFC filter network which is formed by R87 and R93, C69 and C70.

VERTICAL

LOSS OF SYNC

Check by substitution V14 and V13. Check signal W5 for overload and for sync clipping.

If Satisfactory	If Unsatisfactory
Check components associated with V13 and V14, vert. integrator network and C62.	Check video section for component failure or change of value including V6 and V7.

CRITICAL HOLD

Check by substitution V14 and V13. Check C62, T2, R75, R5A and other components associated with V14.

TRIGGERING

Check by substitution V13 and V14. Check circuit near these stages for filament lead dress.

VIDEO

LOSS OF VIDEO

Substitute V7. Check picture tube and component associated with V7 and picture tube.

SOUND BARS (4.5 MC BEAT)

Check adjustment of local oscillator. Check 4.5 MC trap adjustment (A13). Check video IF alignment.

NEGATIVE PIX

Check by substitution V6, V7 and V8. Check adjustment of DX Rangefinder. Check components associated with V6 and V7 for change of value or failure. Check picture tube.

POOR CONTRAST

Check by substitution V6 and V7. Check associated circuit components. Check video IF tubes and alignment.

SMEAR

Check by substitution V6 and V7. Check R42 and R46 for Change of value. Check L14 and L19. Check C34. Check picture tube and other associated components.

WIDE BLACK BAR ACROSS PIX

Check RF tuner, video IF, video detector and video amplifier tubes for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V6, V9, V10, V11 and V12. Check stages of V11 and V12 by switching to AM Radio.

If Satisfactory	If Unsatisfactory
Check TV audio IF amplifier and Ratio detector alignment and components.	Check components associated with V12 and V11 especially C52 and C55.

BUZZ

Realign ratio detector following procedure outlined in the alignment table. If buzz is still objectionable substitute V10 and readjust A10 and A11. Check C5 and C47.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

PARTS LIST AND DESCRIPTIONS

PROPERTY OF
L. F. BLANKENSHIP
3424 MEADE ST.
DENVER, COLORADO

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5A	3rd. Video IF Amp.	6AG5	6AG5	7BD	
B	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	Video Detector - Sound IF Amp.	12AT7	12AT7	9A	
V7	Video Output	6CL6	6CL6	6CL6	
V8	AGC Keying	6AU6	6AU6	7BK	
V9	Limiter	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AM Det-AVC - AF Amp.	6AV6	6AV6	7BT	
V12	Audio Output	6V6GT	6V6GT	7S	
V13	Sync Amplifier Sync Separator	12AU7	12AU7	9A	
V14	Sync Phase Inv. - Vert. Oscillator -	6SN7GT	6SN7GT	8BD	
V15	Vert. Output	6S4	6S4	9AC	
V16	Horiz. AFC	6AL5	6AL5	6BT	
V17	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V19	Damper	6AX4GT	6AX4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	LV Rectifier	5U4G	5U4G	5T	
V22	AM Converter	6BE6	6BE6	7CH	
V23	AM IF Amplifier	6BA6	6BA6	7BK	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	RTMA BASE TYPE	NOTES
V24A	21EP4A	21EP4A	21EP4A	12D	①Circuit changes necessary.
		21EP4①		12D	
		21FP4①		12C	
		21FP4A①		12C	
B	21ZP4	21ZP4		12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲60	450	67C15-27	AFH4-93		BO46		FP447	TVL-2770	
B	■40	350				BR4035			TVA-1608	
C	▲20	350								
C2A	▲80	400	67C15-28	AFH3-142		C109		FP245.3	TVL-3764	
B	■20	350		PRS450/20		BR2035A		TC3501	TVA-1608	
C	▲100	50								
C3	20	475	67A25-1	PRS500/16		BR2050A		TC83	TVA-1804	
C4A	10	25	67C15-19	AFH3-180		BO63		FP345.2	TVL-3719	
B	■10	450				BR102A				
C	▲20	25								
C5	4	50	67A4-9	PRS150/4		BR415		TC30	TVA-1402	
C6	3-9		98A45-96		829-10					
C7	800		94C37-90	EF-001	MFT-1000				503C-D1	
C8	3		94D47-54	SI3NP0	TCZ-3					
C9	.5-3		98A45-23		829-3			CT565A		
C10	47		94D47-50	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C11	800		94C37-91	EF-001	MFT-1000				503C-D1	
C12	1000		98A45-24	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C13	1.5		94D46-84	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C14	800		94C37-90	EF-001	MFT-1000				503C-D1	
C15	47		94D47-50	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C16	.5-3		98A45-23		829-3			CT565A		
C17	10		94D47-51	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C18	5		94D47-52	SI5N750	TCN-5		N750K-050		5TCUB-V5	
C19	1000		98A45-24	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C20	6.8		94D47-53	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C21	800		94C37-90	EF-001	MFT-1000				503C-D1	
C22	800		94C37-90	EF-001	MFT-1000				503C-D1	
C23	120		65B1-10	SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C24	1000		65C6-41	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C25	5000		65C10-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C26A	1500		65A17-2	BPD-2X0015	DD2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C27	3.3		65C6-89	SI3.3NP0	TCZ-3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C28	22		65C6-47	SI22NP0	TCZ-22		NP0K-220	ZT-5422	5TCC-Q22	
C29	5000		65C10-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C30	5000		65C10-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C31A	4000		65A17-1	BPD-2X004	D6-402	TM5DD4	GP2-333-402	DCD-524	5HK-2D4	
B	4000				D6-402		GP2-333-402			
C32	6.8		65C6-71	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C33	5000		65C10-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C34	.1	400	64B5-5	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C35	.1	400	64B5-5	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C36	.1	400	64B5-5	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C37	.001	600	64B9-19	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C38	.47	100	64A10-51	P288-47		PJ2P5		PT4047	2TM-P47	
C39	.47	100	64A10-51	P288-47		PJ2P5		PT4047	2TM-P47	
C40	6.8		65C6-71							
C41	6.8		65C6-71	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C42	39		65C6-88	SI39	D6-390		GP1K-390	UC-5439	5GA-Q39	
C43	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C44	39		65C6-88	SI39	DS-390			UC-5439	SGA-Q39	
C45	5000		65C10-1	BPD-005	MD-502	TM5D5	81L-005	DC-525	5HK-D5	
C46	180		65C6-59							
C47	500		65C6-8	S1500	DS-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C48	.0082	600	64B9-17	P488-0082	DS-322	PTE5D322	GP2-333-322	PT6322	6TM-D32	
C49	.047	200	64B9-9	P488-047	DF-503	PTE4S47		PT4147	2TM-S47	
C50	100		65C6-3	S100	DS-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C51	.0022	600	64B9-17	P488-0022	DS-322	PTE5D322	GP2-333-322	PT6322	6TM-D32	
C52	1000		65C10-3	BPD-01	DD-103	TM5B1	81L-01	DC-511	5BK-S1	
C53	50		65C6-4	S150	DS-500	TM5Q5	GP1K-500	UC-545	5GA-Q5	
C54	5000		65C10-1	BPD-005	MD-502	TM5D5	81L-005	DC-525	5HK-D5	
C55	.01		†63B6-5	†PA-139	DS-103	PTE5B1	GP2-333-103	PT5U	6TM-S1	
C56	.01	600	P688-01		DS-103	PTE6S1	GP2-333-103	PT6U	6TM-S1	Note 1
C57	150		65C6-6	S1500	†PC-178	TM5T15	GP2K-151	UC-5315	5GA-T15	
C58	.047	400	64B9-9	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C59	.022	400	64B9-11	P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C60	.01	400	64B9-13	P488-01	DS-103	PTE4S1	GP2-333-103	PT4U	4TM-S1	
C61A	.002					PTE5D2		PT622		
B	.005		*63B6-2	•PA-120	•PC-100	PTE5D5	•1405-01	PT625	•101C1	
C	.005					PTE5D5		PT625		
C62	4700	500	65B21-472	1464-005		DR5D5		MCB465	MS-25	
C63	.047	600	64A2-14							
C64	.1	600	64B5-5	P488-1	DF-104	PTE6P1		PT601	6TM-P1	
C65	.047	600	64B9-9	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C66	1000	500	65B21-102	1468-001	D6-102	1W5D1	GP2L-102	MC255	1FM-21	
C67	1000	500	65B21-102	1468-001	D6-102	1W5D1	GP2L-102	MC255	1FM-21	
C68	.0082	600	64B9-17	P688-0022	D6-322	PTE6D22	GP2-333-222	PT6222	6TM-D22	Note 3
C69	.0047	600	64B9-15	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C70	.047	400	64B9-9	P488-047	DF- 503	PTE4S47		PT4147	4TM-S47	Note 3
C71	.47	1500	65B21-470							
C72	3900	500	65B1-63	1464-004		DR5D4		MCB463	MS-24	
C73	330	500	65B21-331	1469-00035						
C74	270	500	65B21-271							
C75	.1	600	64B8-57	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C76	.01	600	64B9-13	P688-01	D6-103	PTE6S1	GP2-333-103	PT6U	6TM-S1	
C77	.047	400	64B9-9	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C78	.047	400	64B9-9	P488-047		PTE4S47		PT4147	4TM-S47	
C79	.047	400	64B9-9	P488-047		PTE4S47		PT4147	4TM-S47	
C80	.1	400	64A2-8	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C81	47	1500	65B1-64	HVD15-000047	D16-470				20GA-Q47	
C82	5		65B1-52	SI5	TC2-4.7	5W5V5	GP1K-050	2T-555	5GA-V5	
C83	47		65C6-79	SU47NPO	TC2-47		NP2K-470	ZT-5447	5TCC-Q47	
C84	.1	400	64A3-15	P488-1	DF-104	PTE4P1		PT401	4TM-P 1	
C85	.1	400	64A3-15	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C86	.1	400	64A3-15	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C87	5000		65C10-1	BPD-005	MD-502	TM5D5	81L-005	DC-525	5HK-D5	
C88	100		65C6-3	S100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	

Note 1. Some Models use .0047MFD in this application (part #64B9-15).
Note 2. Some Models use .01MFD in this application (part #64B9-13).
Note 3. Some Models use .0022MFD in this application (part #64B9-17).
† Items C55, R63A, R63B are combined in one unit.
‡ Items C57, R106A, R106B are combined in one unit.
♦ Items C61A, C61B, C61C, R74A, R74B, R74C are combined in one unit.

CONTROLS

ITEM No.	RATING RESIST. ANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	75C2-16	Q19-137X	AT-112	BT-7A-S	UT-443	Volume (Tap at 500KΩ)
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SW-A	Not Req.	US-28	Attach to R1A
R2A	2Meg	½	75B13-23	QU-139	AQ-83-S	AB-7S	U-56	Tone
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R2A
R3A	750Ω	2	75B17-1	Q7-426*			WF-751	Focus-Panel (Wire wound)
B	100KΩ	½					UN15L	Brightness-rear
R4A	1000Ω	1	75B13-21	QU7-108	AG-8-S	AB-5	U-4	Contrast
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R4A
R5A	1.5Meg	½	75B17-2	QF-434**	RTV-403		UF25L	Vert. Hold-Panel
B	25KΩ	½					UR25L	Horiz. Hold-Rear
R6A	3000Ω	½	75B13-7	QU-112	AG-15-S	AB-8	U-8	Vert. Linearty
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	150KΩ	½	75B13-29	QU-129	AG-52-S	AB-46	U-43	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	2.5Meg	½	75B13-5	QU-110	AG-84-S	AB-83	SU-565	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R8A
R9A	5Meg	½	75B1-54	QU-141	AG-85-S	AB-87	SU-67	DX Range Finder
B	Shaft		Not Req.	Not Req.	FS-3	AK-1	Not Req.	Attach to R9A

*CuNCENTRIKIT EQUIVALENT-KIT K-3 BASE ELEMENTS & SHAFTS W13-105 & P3-121 (panel) B11-128 & R12-131 (rear)
**CONCENTRIKIT EQUIVALENT-KIT K-5 BASE ELEMENTS & SHAFTS B11-138 & P1-121 (panel) B11-120 & R12-129 (rear)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R10	15KΩ	½	98A45-67		
R11	47KΩ	½	98A45-17		
R12	100KΩ	½	94C37-87		
R13	390KΩ	½	94D47-59		
R14	1500Ω	½	94D47-58	BTS-1500	
R15	100KΩ	½	94C37-87		
R16	10KΩ	½	98A45-18	BTS-10K	
R17	220KΩ	½	98A45-21	BTS-220K	
R18	8200Ω	½	60B8-822	BTS-8200	
R19	15KΩ	½	98A45-67	BTS-15K	
R20	10KΩ	½	98A45-18		
R21	15KΩ	½	98A45-67		
R22	47Ω	½	80B28-45		
R23	8200Ω 5%	½	60B7-822		
R24	1000Ω 5%	½	60B8-102		
R25	150KΩ	½	60B8-154		
R26	15KΩ 5%	½	60B8-153		
R27	330Ω	½	60B8-331		
R28	470Ω	½	60B8-471	BTS-470	
R29	27KΩ	½	60B8-273		
R30	1000Ω	½	60B8-102	BTS-1000	
R31	10KΩ 5%	½	60B7-103		
R32	330Ω	½	60B8-331	BTS-330	
R33	1000Ω 5%	½	60B8-102	BTS-150	
R34	150Ω	½	60B8-151	BTS-150	
R35	2.7Meg	½	60B8-275	BTS-2.7Meg	
R36	15Meg	½	60B8-156	BTS-15Meg	
R37	100KΩ	½	60B8-104	BTS-100K	
R38	4700Ω	½	60B7-472	BTS-4700	
R39	33KΩ	½	60B8-333	BTS-33K	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R40	270KΩ	½		BTS-270K	
R41	1000Ω 5%	½	60B8-102		
R42	18KΩ	1	60B14-183	BTA-18K	
R43	270KΩ	½	60B8-274	BTS-270K	
R44	1Meg	½	60B8-105	BTS-1Meg	
R45	150KΩ	½	60B8-154	BTS-150K	
R46	6800Ω	½		BTS-6800	
R47	2000Ω	15	61A3-14	2D-2000	
R48	4250Ω	10	61A1-25	1 3/4A-4500	
R49	4700Ω	2	60B20-472	BTB-4700	
R50	6200Ω 5%	½	60B7-622		
R51	100KΩ	½	60B8-104	BTS-100K	
R52	470Ω	2	80B20-471	BTB-470	
R53	470KΩ	½	60B8-474	BTS-470K	
R54	120Ω	½	60B8-121	BTS-120	
R55	1000Ω	½	60B8-102	BTS-1000	
R56	100KΩ	½	60B8-104	BTS-100K	
R57	390Ω	½	60B8-391	BTS-390	
R58	10KΩ	½	60B8-103	BTS-10K	
R59	10KΩ	½	60B8-103	BTS-10K	
R60	47KΩ	½	60B8-473	BTS-47K	
R61	82KΩ	½	60B8-823	BTS-82K	
R62	3.3Meg	½		BTS-3.3Meg	Note 1
R63A	470KΩ	½	†63B6-5	BTS-470K	
B	1Meg	½		BTS-1Meg	
R64	330Ω	1	50B14-331	BTA-330	
R65	2.2Meg	½	60B8-225	BTS-2.2Meg	
R66	2.2Meg	½	60B8-225	BTS-2.2Meg	
R67	22KΩ	1	50B14-223	BTA-22K	
R68	56KΩ	2	60B20-563	BTB-56K	
R69	33KΩ	2	60B20-333	BTB-33K	
R70	2200Ω	½	60B8-222	BTS-2200	
R71	8.2Meg	½	60B8-8-25	BTS-8.2Meg	
R72	10000Ω 5%	½	60B7-102		
R73	2200Ω	½	60B8-222	BTS-2200	
R74A	22KΩ	½		BTS-22K	
B	8200Ω	½	♦63B6-2	BTS-8200	
C	8200Ω	½		BTS-8200	
R75	1.2Meg	½	60B8-125	BTS-1.2Meg	
R76	150KΩ	½	60B8-154	BTS-150K	
R77	1Meg	½	60B8-105	BTS-1Meg	
R78	10KΩ	½	60B7-103		
R79	1Meg	½	60B8-105	BTS-1Meg	
R80	820Ω	½	60B8-821	BTS-820	
R81	560Ω	½	60B8-561	BTS-560	
R82	560Ω	½	60B8-561	BTS-560	
R83	3700Ω	½		BTS-3700	
R84	1200Ω	2	60B20-122	BTB-1200	
R85	100KΩ 5%	½	60B7-104		
R86	100KΩ 5%	½	60B7-104		
R87	4.7Meg	½	60B8-475	BTS-4.7Meg	
R88	47KΩ	2	60B20-473	BTB-47K	
R89	100KΩ	½		BTS-100K	
R90	120KΩ	½	60B8-124	BTS-120K	
R91	1500Ω	½	60B8-152	BTS-1500	
R92	5600Ω	½	60B8-562	BTS-5600	
R93	470KΩ	½	60B8-474	BTS-470K	
R94	5600Ω	½	60B8-562	BTS-5600	
R95	68Ω	½	60B28-44	BTS-68	
R96	1Meg	½	80B8-105	BTS-1Meg	
R97	82Ω	½	60B28-31	BTS-82	
R98	8200Ω	2	60B20-822	BTB-8200	
R99	47Ω	½	60B14-470	BTA-47	
R100	1000Ω	2	60B20-102	BTB-1000	
R101	1000Ω	½	60B8-102	BTS-1000	
R102	4.7Ω	½	60B28-11		
R103	180KΩ 5%	½	60B7-184		
R104	1.5Meg	½			
R105	68Ω	½			
R106A	15KΩ	½	†63B6-4	BTS-15K	
B	270KΩ	½		BTS-270K	
R107	680KΩ	½			Note 3
R108	22KΩ	½	60B8-223	BTS-22K	
R109	10KΩ	1	60B14-103	BTA-10K	
R110	150Ω	½	60B8-151	BTS-150	
R111	27KΩ	1	60B14-273	BTA-27K	
R112	1Meg	½	60B8-105	BTS-1Meg	
R113	5300Ω	½	61A3-16		
R114	4.7Ω	½	60B28-11		Note 2

Note 1. Some Models may use a 4.7Meg resistor in this application.
Note 2. Some Models may use 10Ω resistor in this application.
Note 3. Some Models may use 270KΩ resistor in this application.
† Items R63A, R63B, C59 are combined in one unit.
♦ Items R74A, R74B, R74C, C61A, C61B, C61C, are combined in one unit.
‡ Items R106A, R106B, C57 are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC ⑥ 1.7A	804VCT 260ADC	5VAC ⑥3A	6.3VAC ⑥10.2A	80C35-3					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING SEC.	REPLACEMENT DATA ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	174Ω	1020Ω	79A18-5 79A18-6 ①	A-8125	A-3003	TBC-5	A-97X		Vert.Osc. Trans.
T3	859Ω tap ④	4Ω SEC. 2	79D41-2	A-8135 ⑦	HVO-9 † † MWC-1 ⑦ ④	TFB-18 † TW-8 ⑦ ⑤	D-23 † WC-11 ⑦ ⑤		Horiz.Output Trans.
T4	32Ω, 59Ω 1200Ω	6Ω 8Ω	79B40-3 79B40-2 ⑦	A-8123 ⑤	A-3039 ⑤	TBO-8 ⑤	A-102X ⑤		Vert.Output Trans.
T5A	38Ω		94C51-1	DY-11A ⑤	MDF-73	TY-7 ⑤	Y-22 ⑤		Horiz.Deflection Coils
B	153Ω								Vert. Deflection Coils
T6	420Ω tap ⑪ 154Ω		69D11-1						Focus Coil
T7	17Ω		94A50-1	WC-5 ⑪ ⑫	MWC-6 ⑫	TW-7 ⑫	WC-12 ⑫ ⑬		Horiz. Linearity Coil
T8	27Ω	3.2Ω	94A49-2						Width Coil

① Alternate vertical oscillator transformer
② See instruction sheet packed with unit for terminal connections.
③ Drill new mounting holes.
④ See instruction sheet packed with unit for terminal connections except, remove or short resistor R100 and connect yoke return to terminal #3.
⑤ Connect terminal #6 to terminal #7, then connect original terminal #4 to new terminal #9, original #3 to new #7 and #6, #1. Remove or short resistor R100 and connect yoke return and original #2 to new #3. Connect primary of TW-8 across terminals #3 and #1, secondary to AFC and AGC. If the picture is out of phase, reverse secondary connections.
⑥ (Same as ⑤ with WC-11 in place of TW-8).
⑦ Alternate vertical output transformer.
⑧ Drill one new mounting hole.
⑨ Use original horizontal deflection coil network if necessary.
⑩ Use original horiz. deflection coil network.
⑪ Connect to coded orange and black terminals.
⑫ Drill new mounting hole or use original slider and core.
⑬ Connect to coded red and blue terminals.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T9	5KΩ	3.3Ω	500Ω .35Ω	79C33-6 79C33-7 ①	A-3877 ①	A-2930 ①	RO-9 ①	S-3X ①	① Drill one new mounting hole. ② Used on Ch. 22F2 and 22M2.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA ADMIRAL PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	12"	PM	3.2Ω	78B56-1	12J11	12A31	① Used in models 22ZDX37B, 15B, 16B, and 17B.
B	10"	PM	3.2Ω	78B47-3②	10J11	10A31	② Used in model 122DX12.
C	5"	PM	3.2Ω	78B59-3②	5J4	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES PRI.	DC RES SEC.	REPLACEMENT DATA ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	Ant. Coil	0Ω CT	0Ω	94D46-52				Channel 2
B	Ant. Coil	0Ω CT	0Ω	94D46-53				Channel 3
C	Ant. Coil	0Ω CT	0Ω	94D46-54				Channel 4
D	Ant. Coil	0Ω CT	0Ω	94D46-55				Channel 5
E	Ant. Coil	0Ω CT	0Ω	94D46-56				Channel 6
F	Ant. Coil	0Ω CT	0Ω	94D46-57				Channel 7
G	Ant. Coil	0Ω CT	0Ω	94D46-58				Channel 8
H	Ant. Coil	0Ω CT	0Ω	94D46-59				Channel 9
I	Ant. Coil	0Ω CT	0Ω	94D46-60				Channel 10
J	Ant. Coil	0Ω CT	0Ω	94D46-61				Channel 11
K	Ant. Coil	0Ω CT	0Ω	94D46-62				Channel 12
L	Ant. Coil	0Ω CT	0Ω	94D46-63				Channel 13
L2	Fil. Choke	0Ω		94D45-15				
L3	Mixer Coil	0Ω		94C37-89				
L4A	RF, Mixer Grid & Osc. Coil	0Ω		94D46-72				Channel 2
B	RF, Mixer Grid & Osc. Coil	0Ω		94D46-73				Channel 3
C	RF, Mixer Grid & Osc. Coil	0Ω		94D46-74				Channel 4
D	RF, Mixer Grid & Osc. Coil	0Ω		94D46-75				Channel 5
E	RF, Mixer Grid & Osc. Coil	0Ω		94D46-76				Channel 6
F	RF, Mixer Grid & Osc. Coil	0Ω		94D46-77				Channel 7
G	RF, Mixer Grid & Osc. Coil	0Ω		94D46-78				Channel 8
H	RF, Mixer Grid & Osc. Coil	0Ω		94D46-79				Channel 9
I	RF, Mixer Grid & Osc. Coil	0Ω		94D46-80				Channel 10
J	RF, Mixer Grid & Osc. Coil	0Ω		94D46-81				Channel 11
K	RF, Mixer Grid & Osc. Coil	0Ω		94D46-82				Channel 12
L	RF, Mixer Grid & Osc. Coil	0Ω		94D46-83				Channel 13
L5	Fil. Choke	0Ω		98A45-14				
L6	RF Choke	0Ω		94D46-86				
L7	Conv. Plate	.5Ω		98A45-77				
L8	19.75MC & 27.25MC Trap Assembly			73C12-1				Includes 51 MMF, 10MMF, and 24MMF Cap. and IF Trap Coil
L9	1st. Video IF	.2Ω		72B109-1	17-1001 †	TV-100 †	6186 †	
L10	Fil. Choke	0Ω		73A2-5	19-3001	TV-189	4604	.6 Microhenry
L11	2nd. Video IF	.4Ω	.4Ω	72C96-29	17-1062		6250	Admiral part no. includes C26A, C26B, R26 & R30
L12	21.25MC Trap	.1Ω		72C96-30	19-1020 ■	TV-112 ■	6171 ■	Admiral part no. includes C27, C28 & R29
L13	3rd. Video IF	.4Ω	.4Ω	72D111-1	17-1066		6249	Admiral part no. includes R31
L14	4th. Video IF	9Ω	.4Ω	72B110-1 •				
L15	Series Peaking Coil	5.2Ω		73A5-15	19-3180 ▲	TV-184 ▲	6180 ▲	190 Microhenries, wound on 4.7KΩ resistor
L16	Shunt Peaking Coil	17Ω		73A5-7	19-3500	TV-188	6174	500 Microhenries
L17	4.5MC Trap	5Ω		72B99-3	20-1005 ▲	TV-151	1470	Admiral part no. includes C32
L18	Series Peaking Coil	8.5Ω		73A5-14	19-3250 †	TV-185 †	6181 †	250 Microhenries, wound on 18KΩ resistor
L19	Shunt Peaking Coil	24Ω		73A11-1				790 Microhenries, wound on 10KΩ resistor
L20	1st. Sound IF	6Ω		72B99-4	17-3400	TV-151	1470	58 Microhenries, wound on 1Meg resistor
L21	RF Choke	12Ω		73A5-2			4630 **	
L22	2nd. Sound IF	5Ω		72B99-4				Tertiary winding-.8Ω
L23	Ratio Det.	3.7Ω	.4Ω CT	72B68-2	17-1033 •	TV-110 •	1468 •	Admiral part no. includes C72 and R92
L24	Horiz.Osc.	55Ω		94B17	19-1576	TV-163	6210	
L25	Loop Ant.	1.2Ω		69C115-3				
L26	Osc. Coil	6Ω		69A52-4			71-Osc. †	Tapped ⑥ .4Ω

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L27	Input IF	18Ω	18Ω	72B28-7	16-6758	BC-352	12-C1	
L28	Output IF	18Ω	18Ω	72B28-7	16-6758	BC-353	12-C2	

* Some Models use part #72B113-1 in this application. Used when V5 is a 6AU6.
† Detune trap.
■ Enlarge mounting holes.
▲ Parallel with 4.7KΩ resistor.
● Disconnect capacitor in parallel
‡ Parallel with 18KΩ resistor
**Parallel with 1Meg resistor
♦ Disconnect C46 when using as a replacement.
¶ Drill mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ADMIRAL PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	8AG	3/8A 250V	84A 4-3	84A5-1	361.375 (8AG-3/8Amp)	387001	AGX3/8	4520

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	ADMIRAL PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	409A13	AC-AG-J	A-AG	W26B	A66U	33	0-2orS-2	

ASTATIC SHURE AND ELECTRO VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

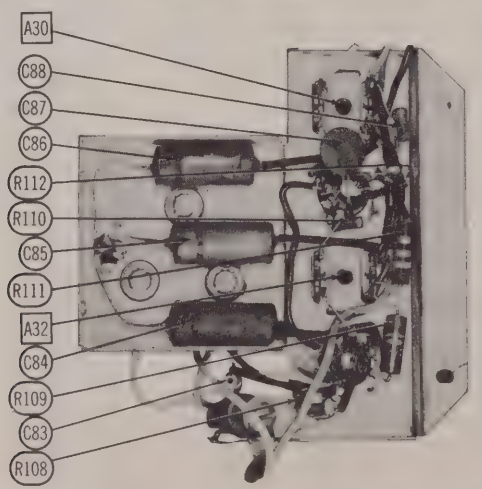
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	ADMIRAL PART No.	WALCO PART No.	JENSEN PART No.	
M3	98A15-19	W-30AGA	JP-312	

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Dial Light	81A1-5	Radio-Phono indicator- Type #44
M5	Pilot Light	81A1-8	Power Indicator - Type #47
M6	RF Tuner	94D61-1	
M7	Switch	77C42	Phono-Radio-TV , function
M8	Correction Magnet	94A44	(Two used)
M9	Ion Trap	94A15-3	
M10	Tuning Cap.	68B53-1	(12-422MMF & 17-120MMF)
	Cabinet	35E233-2	Model 322DX16A
	Back Cover (TV)	A3773	Model 322DX16A
	Control Panel	23D129-4	Model 322DX16A
	Control Panel Door	23D129-5	Model 322DX16A
	Control Panel Door Spring	19A70	Model 322DX16A
	Doors, Front	35E233-51	Matched Set
	Door Handle	37A82	
	Safety Glass	21B64-2	
	Mask	21E132	Plastic
	Knob	33D88-19	Radio tuning
	Knob	33B90-4	TV-Radio-Phono
	Knob	33A23-4	DX Range finder (Black)
	Knob	33C53-23	Channel Selector (Includes gold inserts, maroon)
	Knob	33C53-25	Off/On/Volume (Includes gold inserts, maroon)
	Knob	33D88-20	Contrast (Maroon with gold trim)
	Knob	33D88-21	Fine tuning (Maroon with gold trim)
	Knob	33A92-3	Vertical hold and focus



RADIO CHASSIS BOTTOM VIEW

TROUBLE SHOOTING AIDS (cont)

PROPERTY
L. F. BLANKEN
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If all filaments fail to light, check AC interlock assembly, switch on volume control and T1. If sweep and video IF filaments fail to light, check TV, Radio Phono switch: If filaments light, check V21 and B+ filter and decoupling network components.

SMALL PIX AND/OR DIM RASTER

Substitute V21. Check B+ filter and decoupling components. Proceed as outlined under Horiz. "Insufficient Sweep".

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M1. Check by substitution V17, V18, V19 and V20. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check R102, T3, T5A, R97, R98, C77 and other associated components.	Check C73, C74, C75, C76, R89, R96 and other associated circuit components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V17, V18, V19, V20 and V21. Check picture tube and associated components. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V17, V18, V19, V20 and V21. Check R102, T3, T5A, picture tube and other associated components.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX

Check by substitution V1, V2, V3, V4, V5 and V6. Check associated components.

NO RASTER NO SOUND

See "Dead Set".

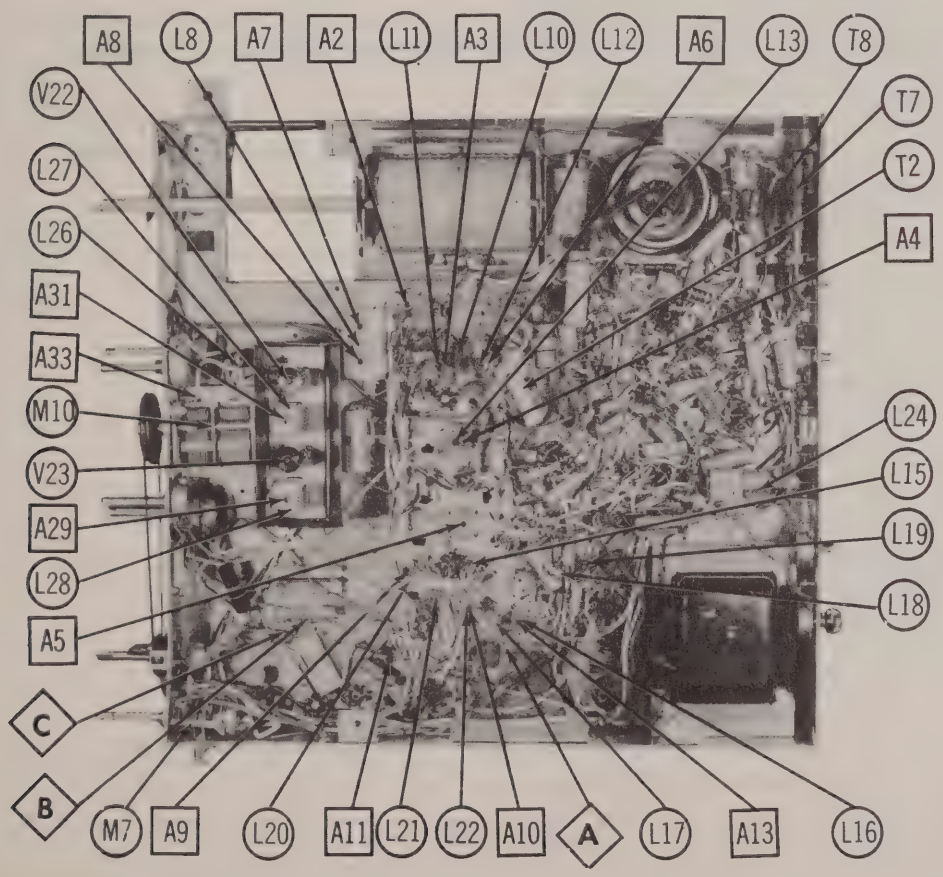
TOTAL LOSS OF SYNC

Check by substitution V13 and V14. Check associated circuit components.

INTERMITTENT STREAKS

Check high voltage section for Corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

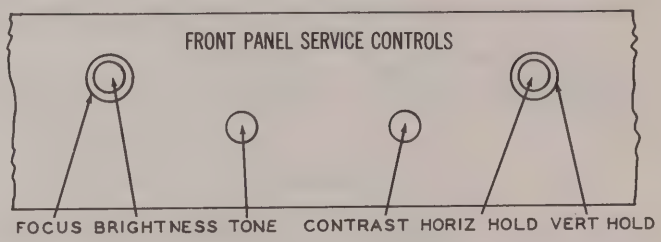
PICTURE TUBE SAFETY GLASS CLEANING

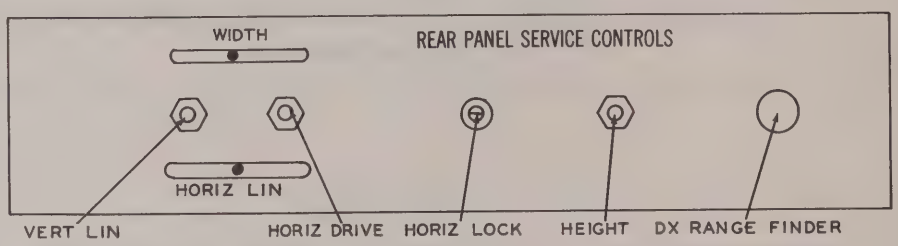
To clean safety glass remove 4 phillips head screws holding wood strip at top of cabinet. Remove wood strip and safety glass by lifting up and out. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





SPECIAL ADJUSTMENTS - DX RANGE FINDER

Reception of weak signals can often be improved by advancing the DX range finder in a clockwise direction. However, if the range finder control is turned too far in this direction the picture may disappear entirely on strong signals.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal lock slug (L24) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L23) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for horizontal sweep circuit protection. (See tube placement chart, for location).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

ANTI-PIN CUSHION CORRECTION

Reduce the picture size so that the side of the raster are visible, and position the magnets so that all sides are straight lines and the corners are at right angles.

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push on type control knobs from front panel.
2. Remove 7 wood and 2 metal screws. Remove rear cover.
3. Disconnect built-in antenna speaker plug, phono motor and audio plugs, and AM antenna loop leads.
4. Remove Jewel Lite from front base of cabinet.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 4 speaker nuts. Remove speaker.

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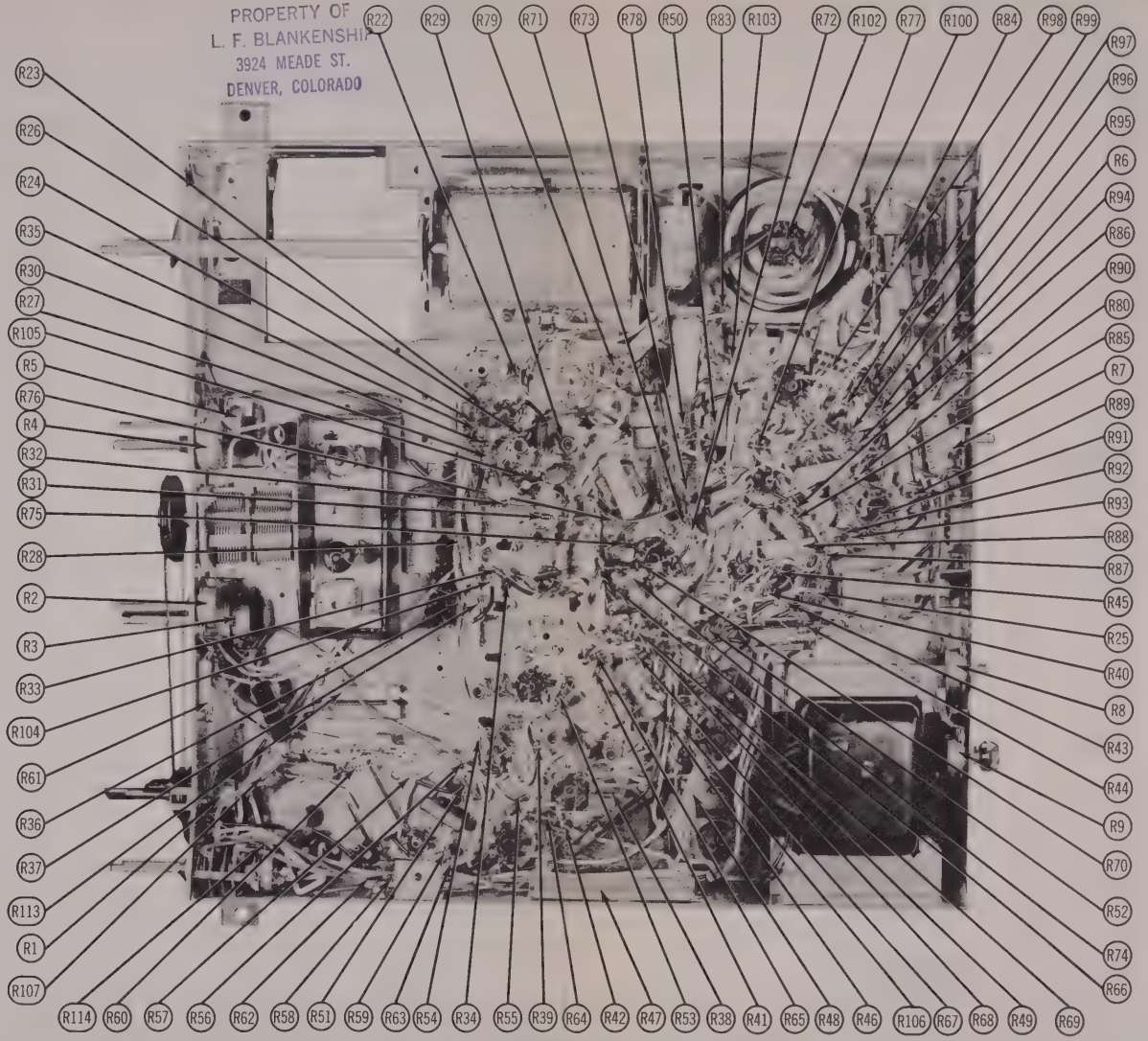
DENVER, COLORADO



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PHOTOFACT* Folder

RETMA MEMBER

AIRLINE MODELS 35WG-3171A, B, 35WG-3173A, B, 35WG-3175A, 35WG-3177A, 35WG-3179A

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

MODEL 35WG-3171A

AIRLINE MODELS 35WG-3171A, B, 35WG-3173A, B, 35WG-3175A, 35WG-3177A, 35WG-3179A

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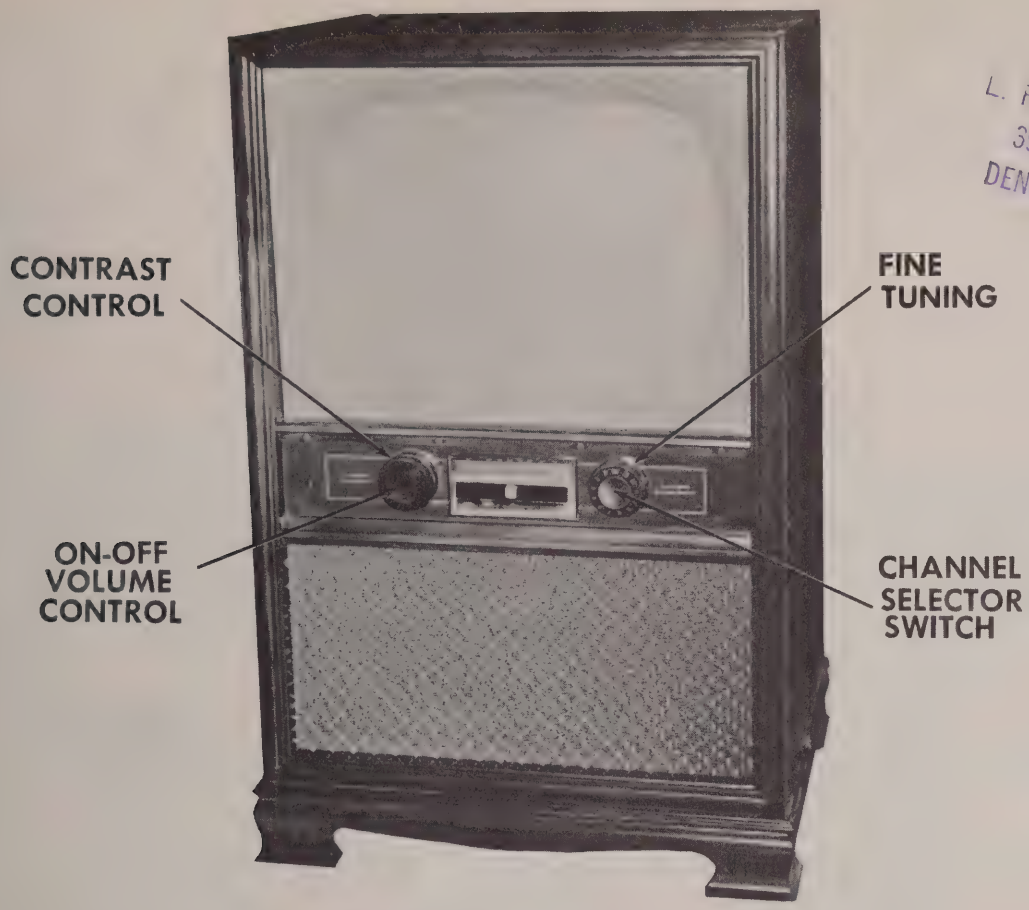
DATE 11-53 SET 222 FOLDER 3

PHOTOFACT* Folder

AIRLINE MODELS
35WG-3171A, B, 35WG-3173A, B, 35WG-3175A, 35WG-3177A, 35WG-3179A

L. F. [illegible]
3924 MEADE ST.
DENVER, COLORADO



AIRLINE MODELS
35WG-3171A, B, 35WG-3173A, B,
35WG-3175A, 35WG-3177A, 35WG-3179A

AIRLINE MODEL 35WG-3171A

TRADE NAME	Airline Models 35WG-3171A, B, 35WG-3173A, B, 35WG-3175A, 35WG-3177A, 35WG-3179A
SUPPLIER	Montgomery Ward & Co., 619 Chicago, Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty-five
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2 Amp. @ 117 Volts AC
TUNING RANGE-	Channels 2 thru 13 VHF, 14 thru 83UHF, Video IF 26.2MC, Sound IF 21.7MC (Intercarrier)

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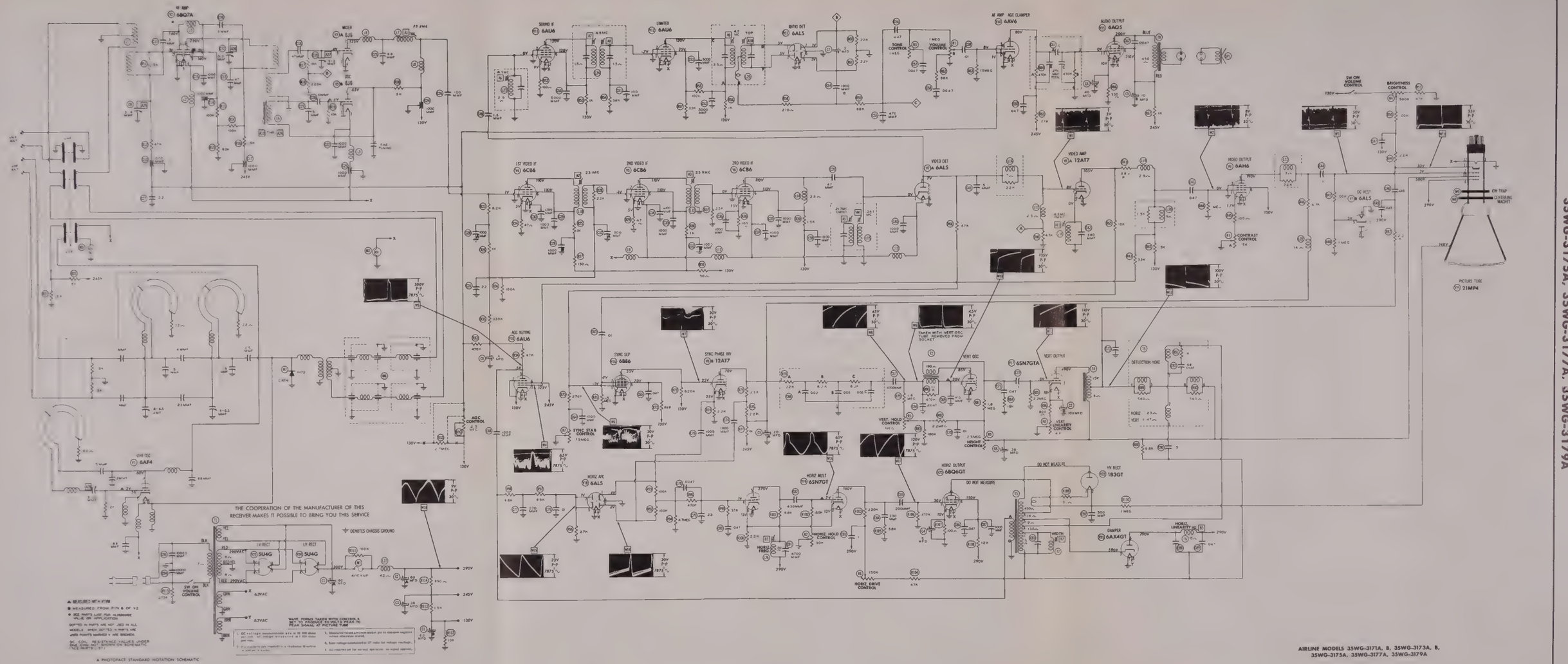
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DENOTES CHASSIS GROUND
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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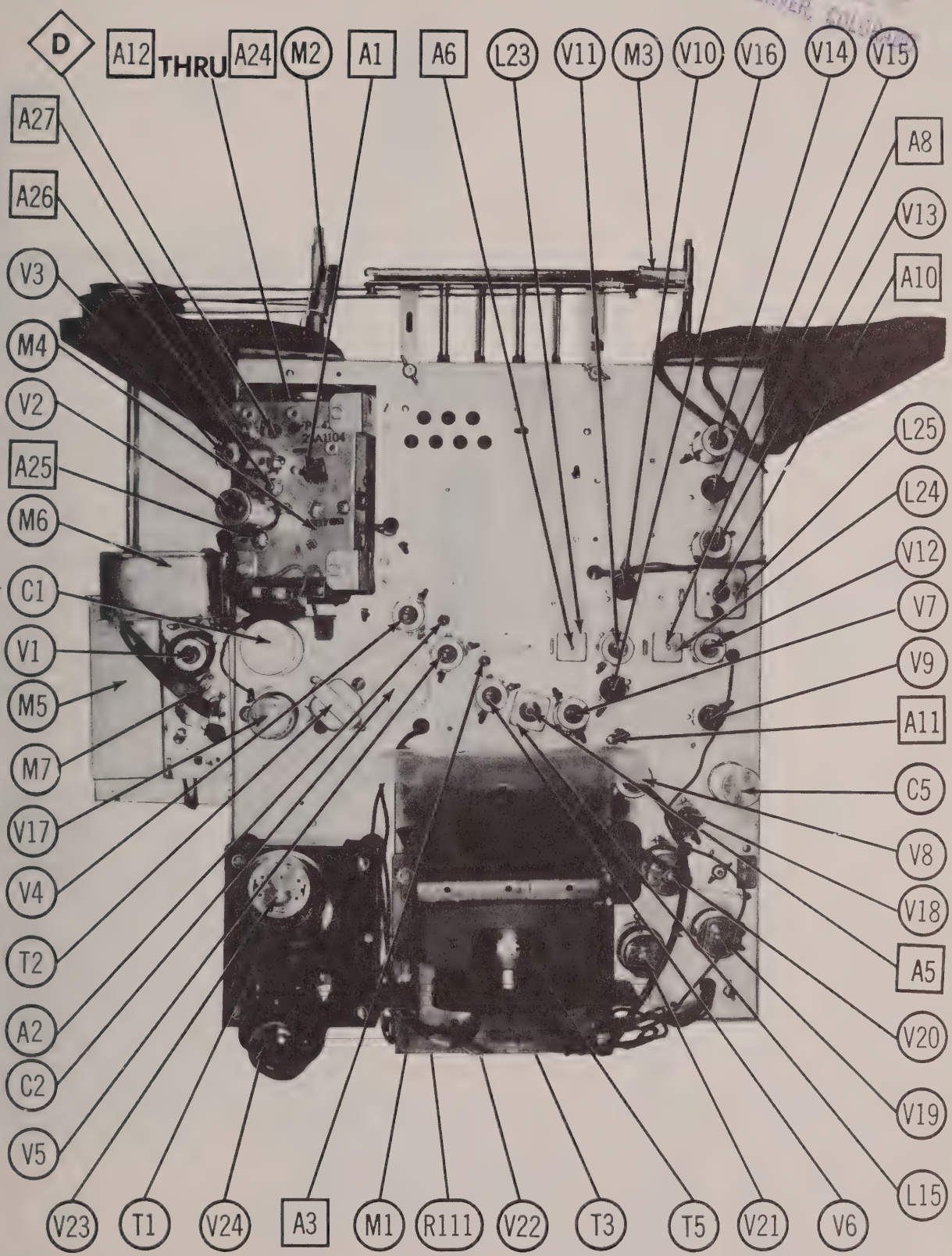
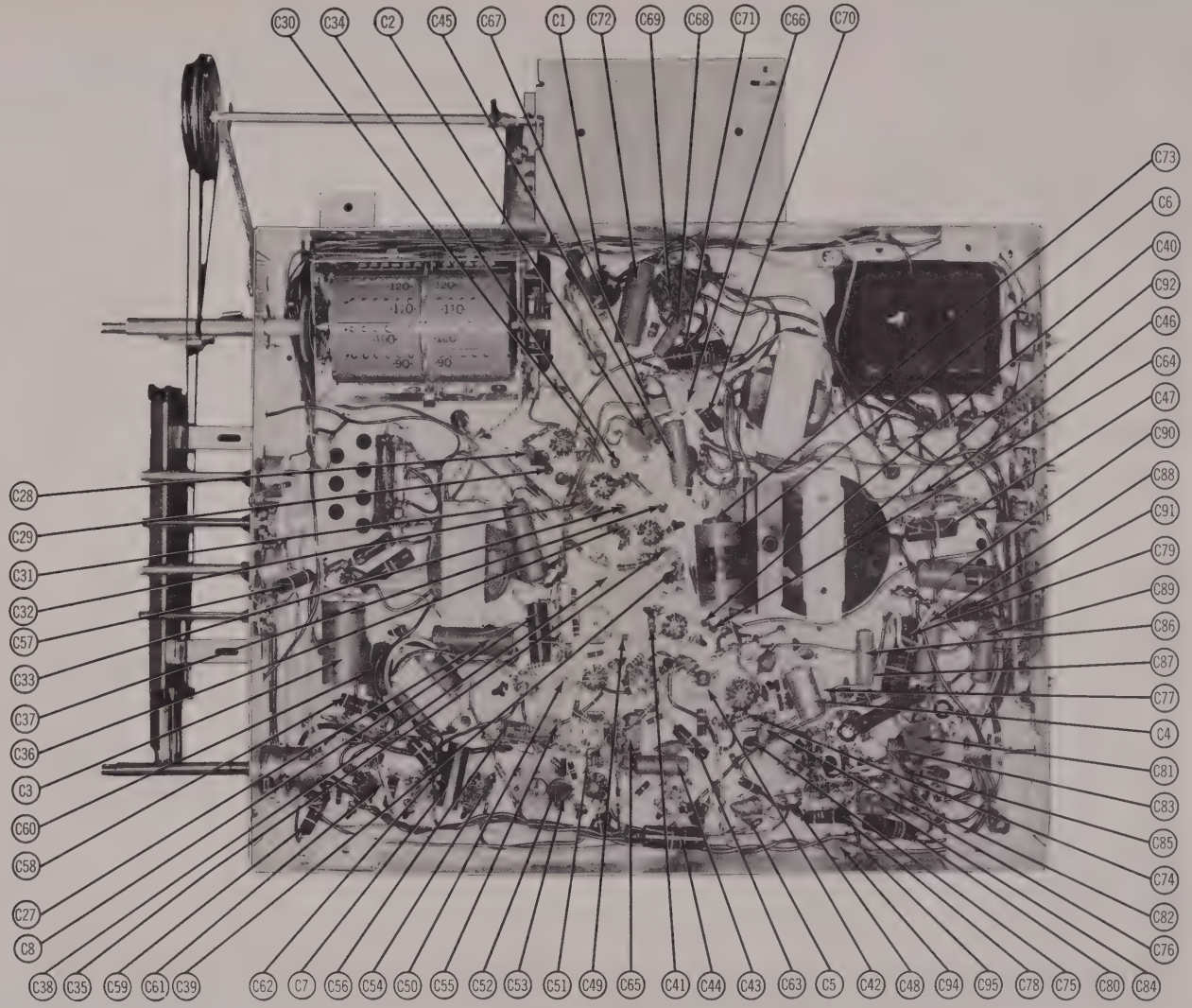
AIRLINE MODELS 35WG-3171A, B, 35WG-3173A, B, 35WG-3175A, 35WG-3177A, 35WG-3179A

AIRLINE MODELS 35WG-3171A, B, 35WG-3173A, B, 35WG-3175A, 35WG-3177A, 35WG-3179A



CHASSIS TOP VIEW

SET 222 FOLDER 3

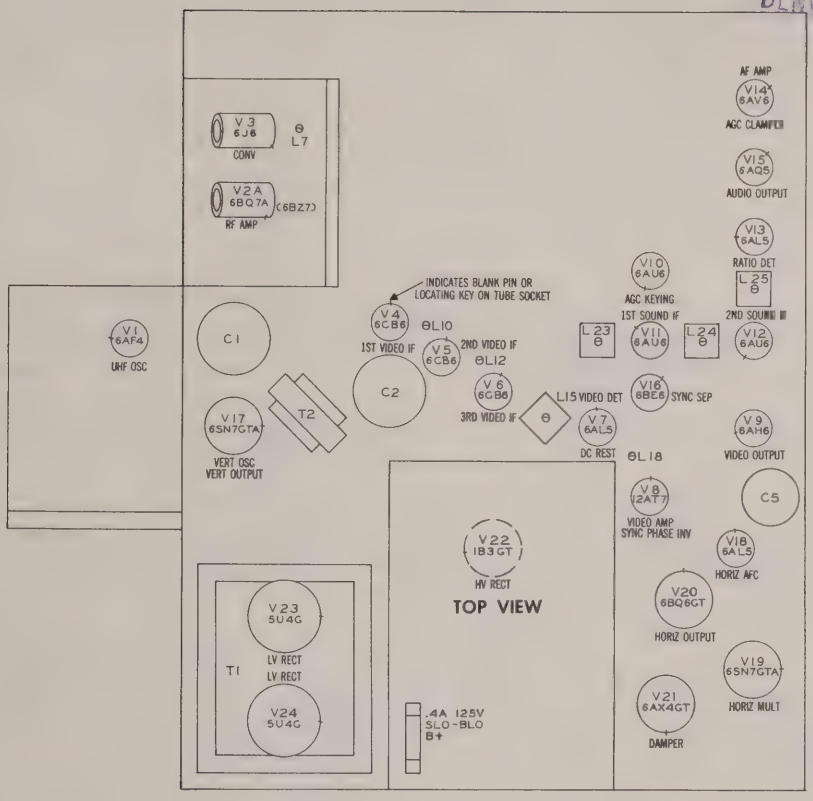


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PROPERTY OF
L. F. RADIO SHOP
3324 WEASE ST.
DENVER, COLORADO

TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V23, V24, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7 (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V8, V9, V25
Has pic, no sound - V11, V12, V13, V14, V15
Overloaded picture - V10, V14

SYNC FAILURE
No vert. sync - V8, V17
No horiz. sync - V8, V18, V19
No vert. or horiz. sync - V8, V16

SWEEP FAILURE
No raster, has sound - V19, V20, V21, V22, V25
No vertical deflection - V17
Poor vert. linearity or foldover - V17
Poor horiz. linearity or foldover - V19, V20, V21
Narrow picture - V19, V20, V21, V22, V23, V24
Vert. off freq. - V8, V17
Horiz. off freq. - V8, V18, V19

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, V19.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 4.5Volt bias supply to the ungrounded side of C31. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.2MC (Unmod.)	Any	DC probe thru decoupling filter (Fig.1) to point A . Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	23.1MC	"	"	A2	"
3.	"	"	25.9MC	"	"	A3	"
4.	"	"	24.1MC	"	"	A4	"
5.	"	"	21.7MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.7MC 23.0MC 23.5MC 25.25MC 26.2MC	Any	Vert. Amp. thru decoupling filter (Fig. 1) to point A . Low side to chassis.		Check for response curve similar to Fig.3. If necessary retouch A1 thru A4 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (cathode) of 6AL5 (V7A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point B . Common to chassis.	A6, A7, A8, A9	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point C . Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (cathode) of 6AL5 (V7A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. thru decoupler (Fig.1) to point B . Low side to chassis.	A6, A7, A8, A9	Disconnect stabilizer capacitor C7. Adjust for curve of maximum amplitide and symmetry as in Fig. 3.
8.	"	"	"	"	"	Vert. Amp. thru decoupler (Fig.1) to point C . Low side to chassis.	A10	Reconnect stabilizer capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Turn contrast control to maximum clockwise position.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to pin 7 of 6AL5 (V7A). Low side to chassis.	Not used	4.5MC (400∿Mod)	Any	Vert. amp. thru decoupler (Fig.1) to pin 2 of picture tube. Low side to chassis.	A 11	Adjust for minimum 400∿ indication on scope

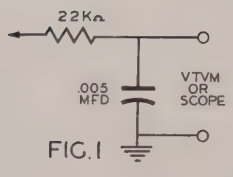


FIG.1

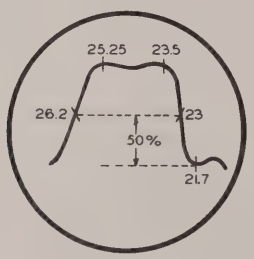


FIG.2

FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The oscillator adjustment screws for each channel are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru decoupler (Fig.1) to point A . Low side to chassis.	A12	Adjust to place sound marker in notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	
11.	"	Across output of UHF tuner	124MC (10MC Swp)	121.75MC 126.25MC	UHF		A24	

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru decoupler (Fig.1) to point D . Low side to chassis.	A25, A26 A27	Adjust for response curve similar to Fig.6. with markers above 90%.
13.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig.6. If markers fall below 70% on any channel make slight compromise adjustment of A24, A25, and A26 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.75MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			
			124MC (10MC Swp)	121.75MC 126.25MC	UHF			

UHF TUNER ALIGNMENT

Due to circuit complexity of the UHF tuner, alignment in the field should not be attempted.
Service should also be limited to the replacement of oscillator tube (V3) and crystal 1N72/1N82.
If either crystal or oscillator is replaced adjustment of the UHF oscillator trimmer, A28, maybe necessary. If necessary, adjust A28 for tuner range of below 470MC to above 890MC.
If the UHF tuner does not operate properly after tube or crystal replacement and adjustment of A28 the tuner should be returned to the factory.

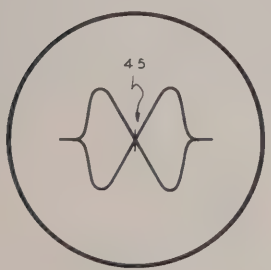


FIG. 4

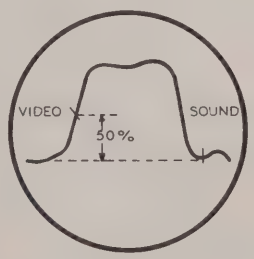


FIG.5

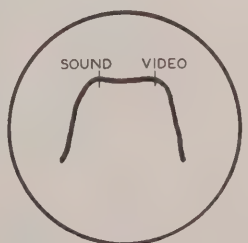
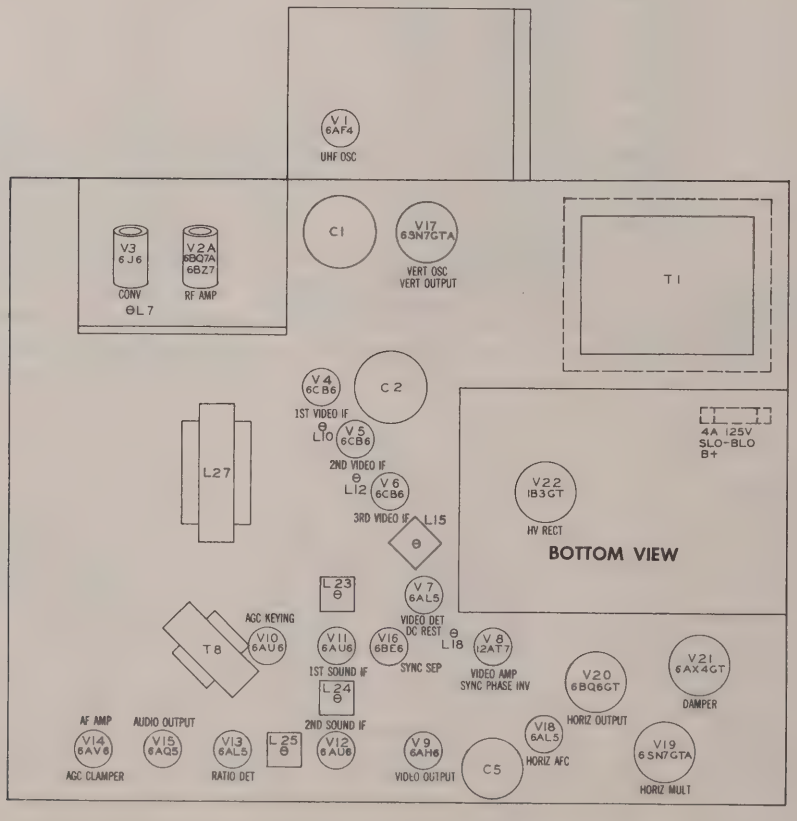


FIG.6

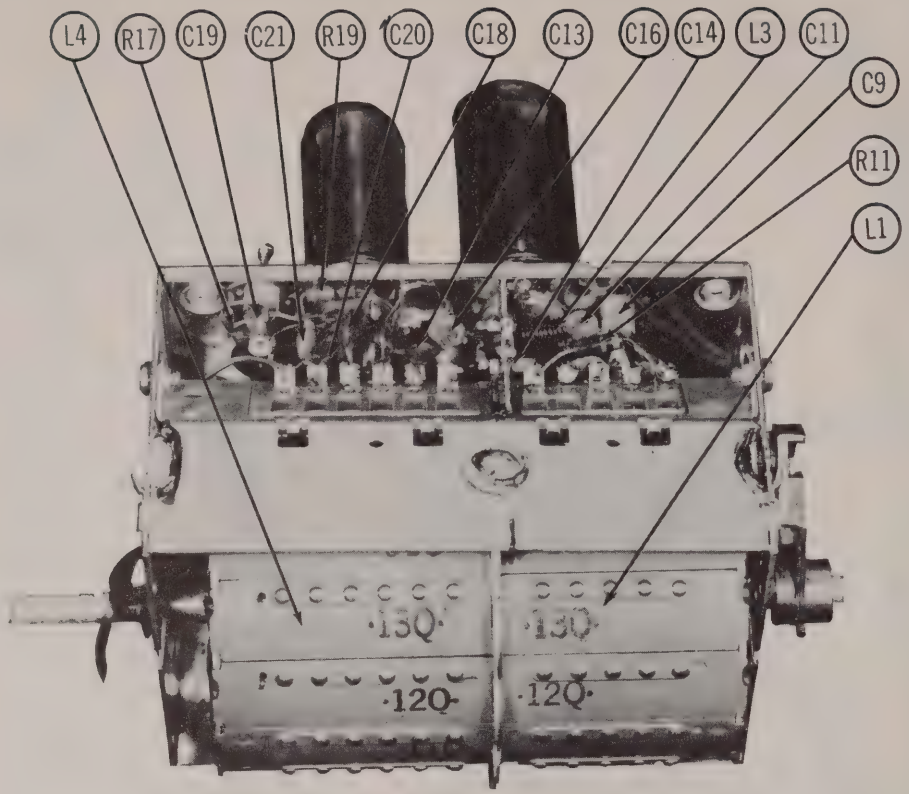
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	■6KΩ	12KΩ	.1Ω	.2Ω	.1Ω	12KΩ	■6KΩ		
V 2	6BQ7A	INF	680KΩ	0Ω	.1Ω	0Ω	■2KΩ	160KΩ	INF	0Ω
V 3	6J6	17KΩ	■2KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 4	6CB6	110KΩ	47Ω	.1Ω	0Ω	■2.8KΩ	■2.8KΩ	0Ω		
V 5	6CB6	100KΩ	47Ω	.1Ω	0Ω	■2.8KΩ	■2.8KΩ	0Ω		
V 6	6CB6	.3Ω	180Ω	.1Ω	0Ω	■3KΩ	■3KΩ	0Ω		
V 7	6AL5	.7Ω	0Ω	.1Ω	0Ω	1Meg	0Ω	4.7KΩ		
V 8	12AT7	■8.5KΩ	4.7KΩ	.2Ω	0Ω	0Ω	■7.5KΩ	■820KΩ	2.2KΩ	.1Ω
V 9	6AH6	1Meg	0Ω	.1Ω	0Ω	■6.2KΩ	■1.8KΩ	500Ω		
V 10	6AU6	■36.5K	■1.8KΩ	.1Ω	0Ω	470KΩ	■400Ω	■1.8KΩ		
V 11	6AU6	.1Ω	0Ω	.1Ω	0Ω	■2.6KΩ	■2.6KΩ	100Ω		
V 12	6AU6	56KΩ	0Ω	.1Ω	0Ω	■2.6KΩ	■24KΩ	0Ω		
V 13	6AL5	INF	INF	0Ω	.1Ω	22KΩ	INF	22KΩ		
V 14	6AV6	10Meg	0Ω	.1Ω	0Ω	680KΩ	680KΩ	■520KΩ		
V 15	6AQ5	470KΩ	330Ω	0Ω	.1Ω	■1.7KΩ	■1.3KΩ	470KΩ		
V 16	6BE6	40KΩ	0Ω	.1Ω	0Ω	■820KΩ	■70KΩ	1.5Meg		
V 17	6SN7GT	2Meg	▲1.7Meg	0Ω	2.2Meg	▲7KΩ	2KΩ	.1Ω	0Ω	
V 18	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	9KΩ	INF	9KΩ		
V 19	6SN7GT	170KΩ	▲340KΩ	2.2KΩ	5Meg	■5.6KΩ	2.2KΩ	.1Ω	0Ω	
V 20	6BQ6GT	5.6KΩ	0Ω	INF	■12KΩ	470KΩ	420KΩ	.1Ω	100Ω	TOP CAP ▲16Ω
V 21	6AX4GT	6.3KΩ	INF	440KΩ	4.5Meg	■50Ω	6.3KΩ	0Ω	.1Ω	
V 22	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								TOP CAP ▲446Ω
V 23	5U4G	INF	10KΩ	INF	18Ω	INF	19.5Ω	INF	10KΩ	
V 24	5U4G	INF	10KΩ	INF	18Ω	INF	19.5Ω	INF	10KΩ	
V 25	21MP4	0Ω	1.1Meg	PIN 6 ■50Ω	PIN 10 ▲6.8KΩ	PIN 11 ■180KΩ	PIN 12 .1Ω			

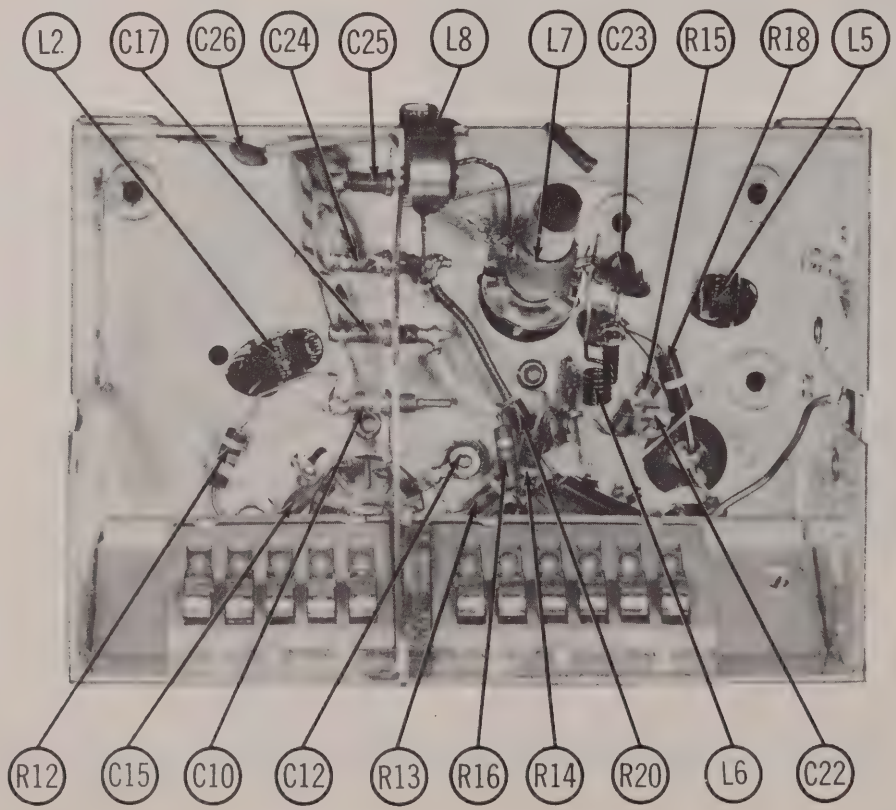
■MEASURED FROM PIN 2 OF V24.
▲MEASURED FROM PIN 3 OF V21.



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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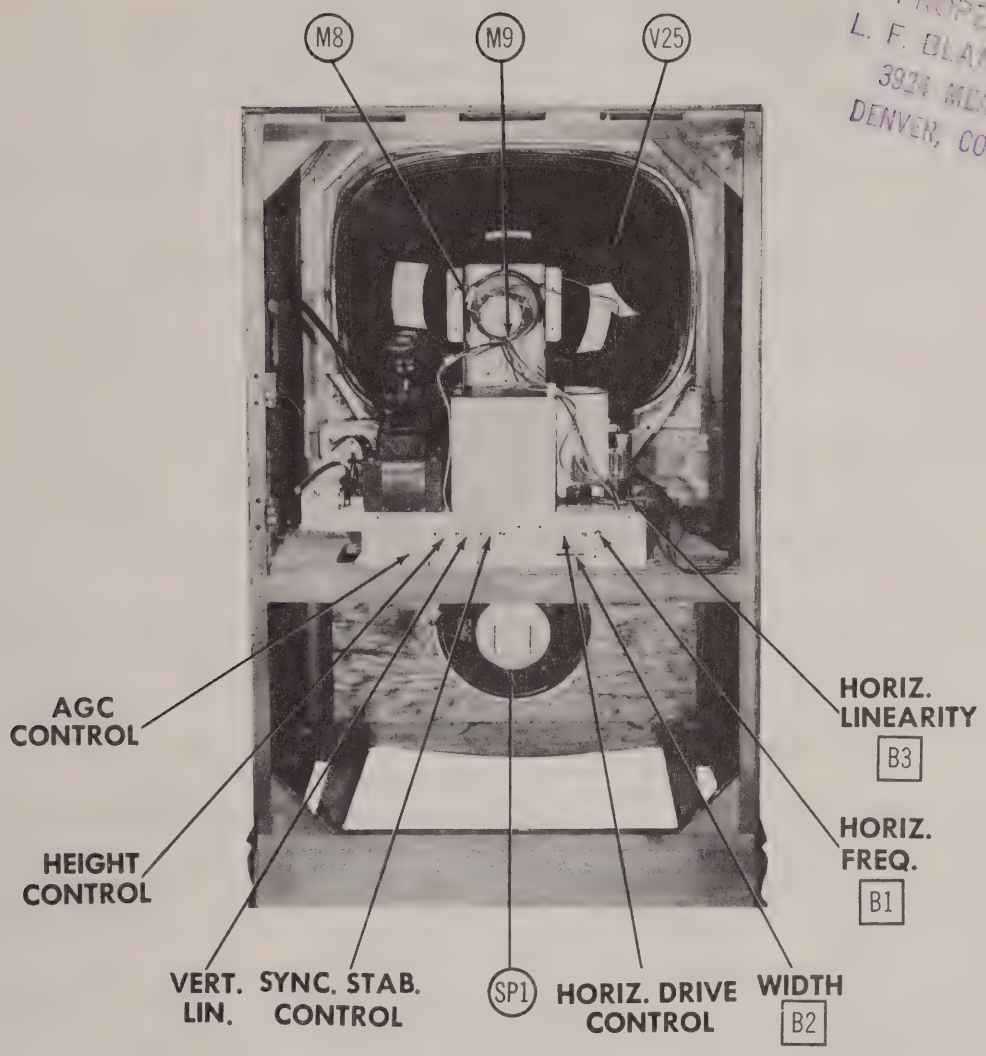
3924 MEADE ST.
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until the picture falls into sync.

Adjust the horizontal drive control for the best compromeise between brightness and linearity.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V19, V20, V21, V23 and V24. Check adjustment of horiz. drive control, B2 and B3. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check C86, C87, C90, C91, T3, T5A, R108 and other associated components.	Check C82, C83, C84, C85, R103, R104, R106, R101, R100, R6 and other associated components.

DRIVE LINES

Check adjustment of horiz. drive control. Check by substitution V19, V20 and V21. Check C83, C84, C85, C88, C89, T3, T5A and other associated circuit components.

COMPRESSED LEFT SIDE

Check horiz. drive adjustment. Check adjustment of B2 and B3. Check by substitution V19, V20 and V21. Check T3, T5A, C86, C87 and other associated components.

FOLDS

Check by substitution V19, V20 and V21. Check T3, T5A and other associated components.

XMAS TREE EFFECT

Substitute V19. Check C81, C82 and other components associated with V19.

VERTICAL

LOSS OF SWEEP

Substitute V17. Check waveform W11.

If Satisfactory	If Unsatisfactory
Check T4 and T5B.	Check C71, C72, C68, C69, R88, R81 and other associated components.

INSUFFICIENT SWEEP

Substitute V17. Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Substitute V17. Check R81, R9, C70, R85, C72 and other associated circuit components.

COMPRESSED AT TOP

Substitute V17. Check C2B, T4, T5B, R8 and other associated components.

FOLDS

Substitute V17. Check assoicated circuit components.

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V18 and V19. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check components associated with V18 and V19 especially R98, R97, R95 R99, C76, C77, C79 and C80.	Check C74, C75, R92 and R93.

CRITICAL HOLD

Check by substitution V18 and V19. Check adjustment of B1. Follow procedure outlined under "Loss of Sync".

HORIZONTAL BENDING OR S-ING

Check by substitution V19, V20, V16 and V8. Check adjustment of sync stability and AGC threshold controls. Check C1A and C2A.

VERTICAL

LOSS OF SYNC

Check by substitution V16, V8 and V17. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check components associated with V17 especially C68 and T2.	Check vert. integrator network C67, C63 and other components associated with V16 and V8.

CRITICAL HOLD

Substitute V17, V16 and V8. Check adjustment of sync stability and AGC threshold controls. Proceed as outlined under "Loss of Sync".

TRIGGERING

Check by substitution V17, V16 and V8. Check circuit near these stages for filament lead dress.

VIDEO

LOSS OF VIDEO

Check by substitution V7, V8 and V9. Check picture tube and other associated components especially coupling capacitors and plate load resistors.

SOUND BARS (4.5 MC BEAT)

Check alignment of local oscillator. Check adjustment of 4.5 MC trap (A11). Check video IF alignment.

NEGATIVE PIX

Check by substitution V7, V8, V9 and V10. Check setting of the AGC threshold control. Check picture tube and other associated circuit components.

POOR CONTRAST

Check by substitution V1, V4, V5, V6, V7, V8 and V9. Check associated circuit components. Check picture tube.

SMEAR

Check by substitution V7, V8 and V9. Check L16, L20 and L21. Check C41, C43 and C44. Check R41, R42, R44 and R46 for change of value. Check picture tube and other associated components.

WIDE BLACK BAR ACROSS PIX

Check tuner, video IF, video detector and video amplifier tubes for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V11, V12, V13, V14 and V15. Check stages of V14 and V15 using audio signed generator. Apply signal across R63.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V14 and V15 especially C61.

BUZZ

Realign audio IF and ratio detector following procedure outlined in the alignment section. If buzz is still objectionable substitute V13 and readjust A9 and A10. Check C54 and C7.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

PARTS LIST AND DESCRIPTIONS

PROPERTY OF L. F. BLANKENSHIP 3924 MEADE ST DENVER, COLORADO

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIR LINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2A	RF Amplifier	6BQ7A	6BQ7A	9AJ	
B	RF Amplifier	6BZ7	6BZ7	9AJ	
V3	Converter	6J6	6J6	7BF	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector-DC Restorer	6AL5	6AL5	6BT	
V8	Video Amplifier Sync Phase Inv.	12AT7	12AT7	9A	
V9	Video Output	6AH6	6AH6	7BK	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V12	Limiter	6AU6	6AU6	7BK	
V13	Ratio Detector	6AL5	6AL5	6BT	
V14	AF Amplifier-AGC Clamper	6AV6	6AV6	7BT	
V15	Audio Output	6AQ5	6AQ5	7BZ	
V16	Sync Separator	6BE6	6BE6	7CH	
V17	Vert. Oscillator - Vert. Output	6SN7GTA	6SN7GTA	8BD	
V18	Horiz. AFC	6AL5	6AL5	6BT	
V19	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V20	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V21	Damper	6AX4GT	6AX4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	
V24	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: AIR LINE PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	RTMA BASE TYPE	NOTES
V25	21MP4	21MP4	21MP4	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIR LINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲80	400	45X390	AFH3-46		CO37		FP378	R1341	
B	▲60	400								
C2A	▲80	400	45X391	AFH3-142		C109		FP375	TVL-3764	
B	▲100	50								
C3	30	400	45X393	PRS450/30		BR3045A		TC77	TVA-1711	
C4	5	25	45X378	PRS150/4		BR550		TC30	TVA-1203	
C5A	■20	400	45X392	AFH3-137		CO97		FP366	TVL-3751	
B	▲10	400								
C	40	50								
C6	30	400	45X393	PRS450/30		BR3045A		TC77	TVA-1711	
C7	5	25	45X378	PRS150/4		BR550		TC30	TVA-1203	
C8	4	100	45X361	PRS150/4		BR415		TC40	TVA-1402	
C9	3-9		31B-207		829-10					
C10	1000		13D-153	EF-001	MFT-1000				503C-D1	
C11	3		CD8C3R6C	SI3NP0						
C12	.5-3		31B-206		829-3			CT565A		
C13	47		CD8Q470K	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C14	1000		13D-196	EF-001	MFT-1000				503C-D1	
C15	1000		CD8X102Z	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C16	1.5		CD8C1R5M	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C17	1000		13D-153	EF-001	MFT-1000				503C-D1	
C18	47		CD8Q470K	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C19	.5-3		31B-206		829-3			CT565A		
C20	10		CD10C100K	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C21	5		CD8U050C	SI5N750	TCN-5		N750K-050		5TCUB-V5	
C22	1000		CD8X102Z	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C23	6.8		CD8C6R8C	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C24	1000		13D-153	EF-001	MFT-1000				503C-D1	
C25	1000		13D-153	EF-001	MFT-1000				503C-D1	
C26	120		13D-055	BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C27	.22	200	RCP10M2224M	P488-22		PTE4P22		PT4025	2TM-P22	
C28A	1000		80X3	BPD-2X001	DD2-102	TM5DD1	812-001	DCD-521	5HK-2D1	
B	1000									
C29	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C30	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C31	.22	200	RC10M2224M	P488-22		PTE4P22		PT 4025	2TM-P22	
C32A	1000		80X3	BPD-2X001	DD2-102	TM5DD1	812-001	DCD-521	5HK-2D1	
B	1000									
C33	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C34	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C35	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C36	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C37	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C38	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C39	47		47X603	SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C40	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C41	5		47X562	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C42	360	500	47X568							
C43	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C44	.1	400	RCP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C45	.047	600	RCP10M6473M	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C46	.015	600	RCP10M6153M	P688-015		PTE6S15		PT6115	6TM-S15	
C47	.1	200	RCP10M2104M	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C48	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	

SET 222 FOLDER 3

AIRLINE MODELS 35WG-3171A, B, 35WG-3173A, B, 35WG-3175A, 35WG-3177A, 35WG-3179A

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TIONS (Continued)

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RATING		REPLACEMENT DATA		NOTES
OHMS	WATT	AIRLINE PART No.	IRC PART No.	
22KΩ	½		BTS-22K	
8200Ω	½	•76X7	BTS-8200	
8200Ω	½		BTS-8200	
1.8Meg	½	B84185	BTS-1.8Meg	
470KΩ	½	B85474	BTS-470K	
1.8Meg	½	B84185	BTS-1.8Meg	
2.2Meg	½	B84225	BTS-2.2Meg	
180KΩ	½	B84184	BTS-180K	
10KΩ	½	B84103	BTS-10K	
2.2Meg	½	B84225	BTS-2.2Meg	
820Ω	½	B84821	BTS-820	
2200Ω	½	B84222	BTS-2200	
6800Ω	2	D84682	BTB-6800	
560Ω	½	B84561	BTS-560	
560Ω	½	B84561	BTS-560	
1000Ω	½	B85102	BTS-1000	
100KΩ	½	B84104	BTS-100K	
100KΩ	½	B84104	BTS-100K	
4.7Meg	½	B85475	BTS-4.7Meg	
470KΩ	½	B85474	BTS-470K	
27KΩ	½	B84273	BTS-2700	
6800Ω	1	C84682	BTA-6800	
6800Ω	1	C84682	BTA-6800	
33KΩ	½	B84333	BTS-33K	
2200Ω 5%	½	B83222	BTS-2200 5%	
5600Ω 5%	1	C83562	BTA-5600 5%	
150KΩ 5%	½	B83154	BTS-510K 5%	
220KΩ 5%	½	B83224	BTS-220K 5%	
47KΩ	½	B84473	BTS-47K	
5600Ω	½	B84562	BTS-5600	
470KΩ	½	B84472	BTS-470K	
100Ω	2	D84101	BW-2-100	
12KΩ	5	43X276	1 3/4A-12K	
5.1Ω	½	47X239		
1Meg	1	C85105		
100KΩ	2	D85104	BTB-100K	
10KΩ	5	43X272	1 3/4A-10K	
1500Ω	15	43X275	2D-1500	
330Ω	10	43X273	1 3/4A-350	
270KΩ	½	B85274	BTS-270K	

uit.

POWER)

REPLACEMENT DATA				
TANCOR ART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.

EP CIRCUITS)

DATA			NOTES
CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	
FBO-5	A-97X		Vert.Osc.Trans.
TFB-18① ③	D-22①④		Horiz.Output Trans.
TW-6	& WC-11		
TSO-8 ⑤ ⑥	A-102X ⑤		Vert.Output Trans.
TY-3 ⑧	Y-17		Horiz.Deflection Coils Vert. Deflection Coils
TW-7	WC-12⑨		Horiz.Linearity Coil
TW-2 ⑩			Width Coil

#7, original #4 to new #5, original #1
econdary to AFC (if pcture is out of phase, reverse

#9, original #5 to new #7 and 8, original #4 to new
3 and 1 and secondary to AFC (If picture is out

#9, original #5 to new terminal 7 and 8, original #4
rminals 3 and 1 and secondary to AFC (if picture

IO OUTPUT)

MENT DATA			NOTES
MERIT RT No.	CHICAGO PART No.	TRIAD PART No.	
30	RO-9 ①	S-3X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	VIKING PART No.	QUAM PART No.	
SP1	10"	PM	3.6Ω	12A480 12A504 ① 12A502 ②	10J11	10A31	① 6" PM speaker, not used in all Models. ② 12" PM speaker used in console Models.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	AIRLINE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1A	Ant. Coil	0Ω CT	0Ω	A9A2297-2				Channel 2
B	Ant. Coil	0Ω CT	0Ω	A9A2297-3				Channel 3
C	Ant. Coil	0Ω CT	0Ω	A9A2297-4				Channel 4
D	Ant. Coil	0Ω CT	0Ω	A9A2297-5				Channel 5
E	Ant. Coil	0Ω CT	0Ω	A9A2297-6				Channel 6
F	Ant. Coil	0Ω CT	0Ω	A9A2297-7				Channel 7
G	Ant. Coil	0Ω CT	0Ω	A9A2297-8				Channel 8
H	Ant. Coil	0Ω CT	0Ω	A9A2297-9				Channel 9
I	Ant. Coil	0Ω CT	0Ω	A9A2297-10				Channel 10
J	Ant. Coil	0Ω CT	0Ω	A9A2297-11				Channel 11
K	Ant. Coil	0Ω CT	0Ω	A9A2297-12				Channel 12
L	Ant. Coil	0Ω CT	0Ω	A9A2297-13				Channel 13
L2	Fil.Choke	0Ω		34A-546				
L3	Neutr.Coil	0Ω		31B-296				
L4A	RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-2				Channel 2
B	RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-3				Channel 3
C	RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-4				Channel 4
D	RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-5				Channel 5
E	RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-6				Channel 6
F	RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-7				Channel 7
G	RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-8				Channel 8
H	RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-9				Channel 9
I	RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-10				Channel 10
J	RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-11				Channel 11
K	RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-12				Channel 12
L	RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-13				Channel 13
L5	Fil. Choke	0Ω		34A-575				
L6	RF Choke	0Ω		31B-295				
L7	1st. Video IF	1Ω		31A-078				
L8	RF Choke	1.2Ω		31B-230				
L9	Fil. Choke	0Ω		9A2033	19-3001	TV-189	4602	1 Microhenry
L10	2nd. Video IF	.3Ω	.3Ω	9A2230	17-1063		6249	
L11	Fil. Choke	0Ω		9A2033	19-3001	TV-189	4602	1 Microhenry
L12	3rd. Video IF	.3Ω	.3Ω	9A2230	17-1064		6250	
L13	Fil. Choke	0Ω		9A2033	19-3001	TV-189	4602	1 microhenry
L14	RF Choke	2.5Ω		9A1979	19-3036	TV-180	4628	36 Microhenries
L15	4th. Video IF	.2Ω		9A2226		TV-101	6187	Includes trap
L16	Series Peaking Coil	7Ω		36A10	19-4060	TV-180 †	6172 †	60 Microhenries, wound on 22KΩ resistor
L17	Shunt Peaking Coil	25Ω		36A11	19-3500	TV-188	6174	500 Microhenries
L18	4.5MC Trap	.3Ω		9A2074	20-1004	TV-151	1470	
L19	Series Peaking Coil	2.5Ω		9A1979	19-3036	TV-180	6176	36 Microhenries
L20	Shunt Peaking Coil	9Ω		36A16	19-3075 ▲	TV-181▲	6172 ▲	80 Microhenries, wound on 1.5KΩ resistor
L21	Series Peaking Coil	13Ω		36A12	19-4160	TV-184 †	4644 †	160 Microhenries, wound on 22KΩ resistor
L22	Shunt Peaking Coil	14Ω		36A2	19-3180	TV-184	6180	190 Microhenries
L23	1st. Sound IF	2.5Ω		9A2168	17-1031 ▲	TV-113 ♯	1470A ■	
L24	2nd. Sound IF	1.5Ω	1.5Ω	9A2170		TV-113	6203	
L25	Ratio Det.	3.5Ω	.6ΩCT	9A2269 *	17-1033	TV-110	1468	Tertiary winding-.2Ω
L26	Horiz.Osc.	70Ω		9A2096	19-1576	TV-163	6210	

* Some Models use Ratio Det. part #9A2295 (has numerical terminal identification)
Ratio Det. (part #9A2269) has alphabetical terminal identification)
† Parallel with 22KΩ resistor
▲ Parallel with 1.5KΩ resistor
▲ Drill mounting holes
♯ Detune unused winding
■ Add 47MMF Cap. externally

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	AIR LINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L27	.270ADC	42Ω	1.68 Hy.	52X91	C-2326 ①	C-2996 ①	TR-1733 ①	C-17X ①

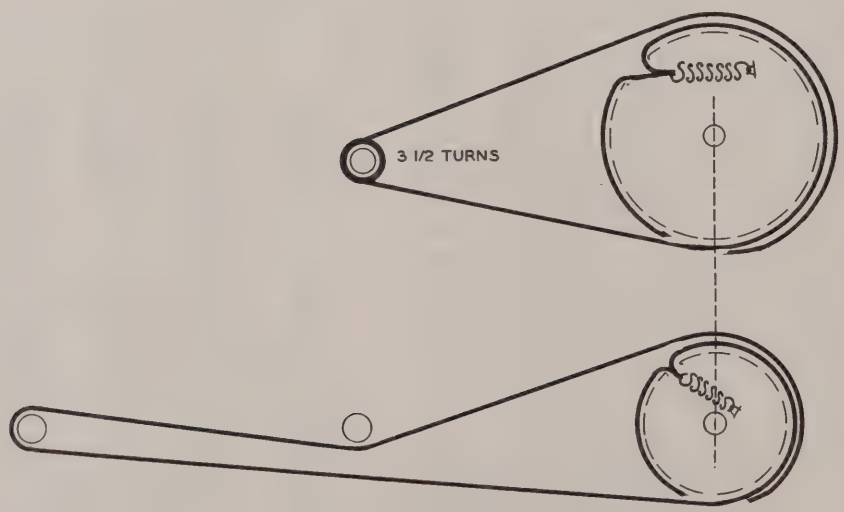
① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AIR LINE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	4/10A 125V	16X147-3	16X146	313.400 (4/10A-125V)	357001	MDL4/10	4405

MISCELLANEOUS

ITEM No.	PART NAME	AIR LINE PART No.	NOTES
M2	Dial Light	7A32	Type #51 - Channel Indicator
M3	Dial Light	7A32	Type #51 - UHF Dial
M4	VHF Tuner	25A-1104	
M5	UHF Tuner	25A-1105	
M6	Trap, UHF Filter		
M7	Crystal		1N72 (1N82 may be used) UHF tuner
M8	Magnet	2A426	Focus and centering
M9	Magnet	2A407	Ion Trap
	Back Cover	S-14X69	
	Dial Glass	58X768	UHF
	Safety Glass	17X175	Models 35WG-3171A and 35WG-3173A
	Safety Glass	17X179	Models 35WG-3171B and 35WG-3173B
	Safety Glass	17X176	Models 35WG-3175A, 35WG-3177A, and 35WG-3179A
	Mask	4X1212-1	Picture tube Models 35WG-3171A and 35WG-3173A
	Mask	4X1220-1	Picture tube Models 35WG-3171B and 35WG-3173B
	Mask	4X1220-4	Picture tube Models 35WG-3175A and 35WG-3177A
	Mask	4X1220-5	Picture tube Models 35WG-3179A
	Knob	10A820-1	Fine tuning (Maroon)
	Knob	10A821-1	Contrast (Maroon)
	Knob	10A822-1	Channel Selector (Maroon)
	Knob	10A779	Volume (Maroon)
			Models 35WG-3171A, 35WG-3171B, 35WG-3175A, 35WG-3179A
	Knob	10A820-2	Fine tuning (Beige)
	Knob	10A821-3	Contrast (Beige)
	Knob	10A822-3	Channel Selector (Beige)
	Knob	10A812-4	Volume (Beige)
			Models 35WG-3173A, 35WG-3173B, 35WG-3177A



UHF DIAL CORD STRINGING

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light check AC interlock assembly, switch on volume control and T1. If filaments light check M1, V23, V24 and B+ filter and decoupling network components.

SMALL PIX AND / OR DIM RASTER

Substitute V23 and V24. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V19, V20, V21 and V22. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check R109, R110, C92, T3, T5A and other associated components.	Check C82, C84, C85, R103, R104, R106 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, V21, V22, V23 and V24. Check picture tube and associated components.

BLOOMING

Check by substitution V19, V20, V21, V22, V23 and V24. Check R109, R110, C92, T3, T5A, picture tube and other associated components.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX (VHF)

Substitute V1, V2, V4, V5, V6 and V7. Check associated components.

RASTER NO SOUND NO PIX (UHF)

Substitute V1, V2, V3, V4, V5, V6 and V7. Check associated components. NOTE! It may be necessary to try several tubes in the UHF tuner to find one that will operate satisfactory.

NO RASTER NO SOUND

See "Dead Set".

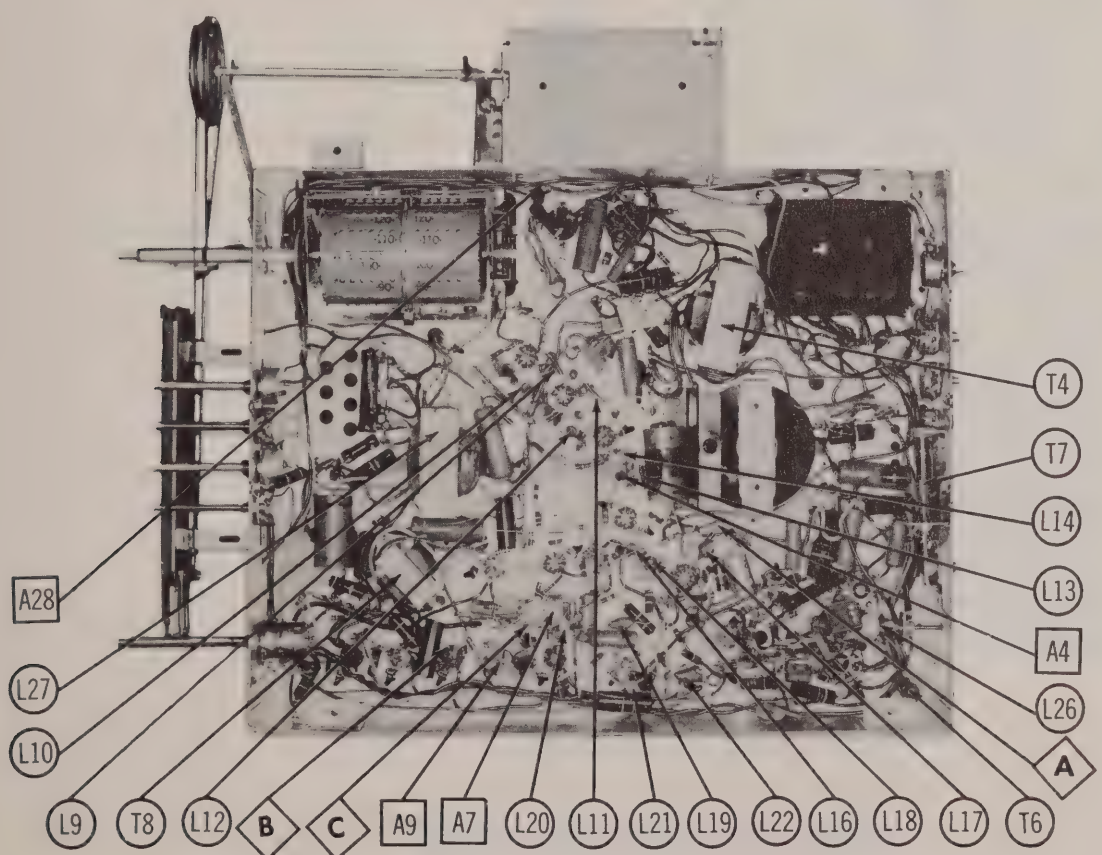
TOTAL LOSS OF SYNC

Check by substitution V16 and V8. Check associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

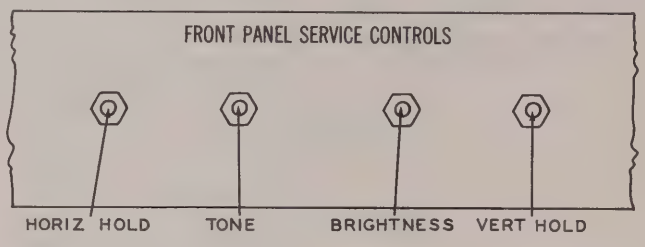
Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

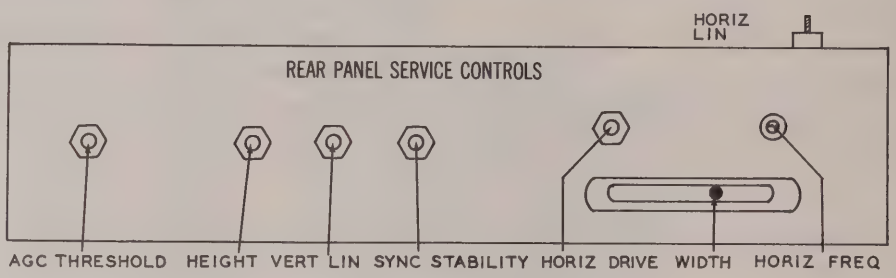
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 4 wood screws holding wood strip at bottom of safety glass. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).





SPECIAL ADJUSTMENTS - SYNC STABILITY CONTROL

Tune set to strongest TV signal available turn the sync stability control clockwise until bending of the picture occurs at the top, then turn counter clockwise until the bending just disappears.

AGC THRESHOLD CONTROL - Tune in strongest TV signal . Turn the control clockwise until overloading appears. turn control counter clockwise until overloading disappears.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal frequency slug (L26) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF detector buzz, adjust the ratio detector secondary (L25) located on top of chassis. (See tube placement chart).

FUSES

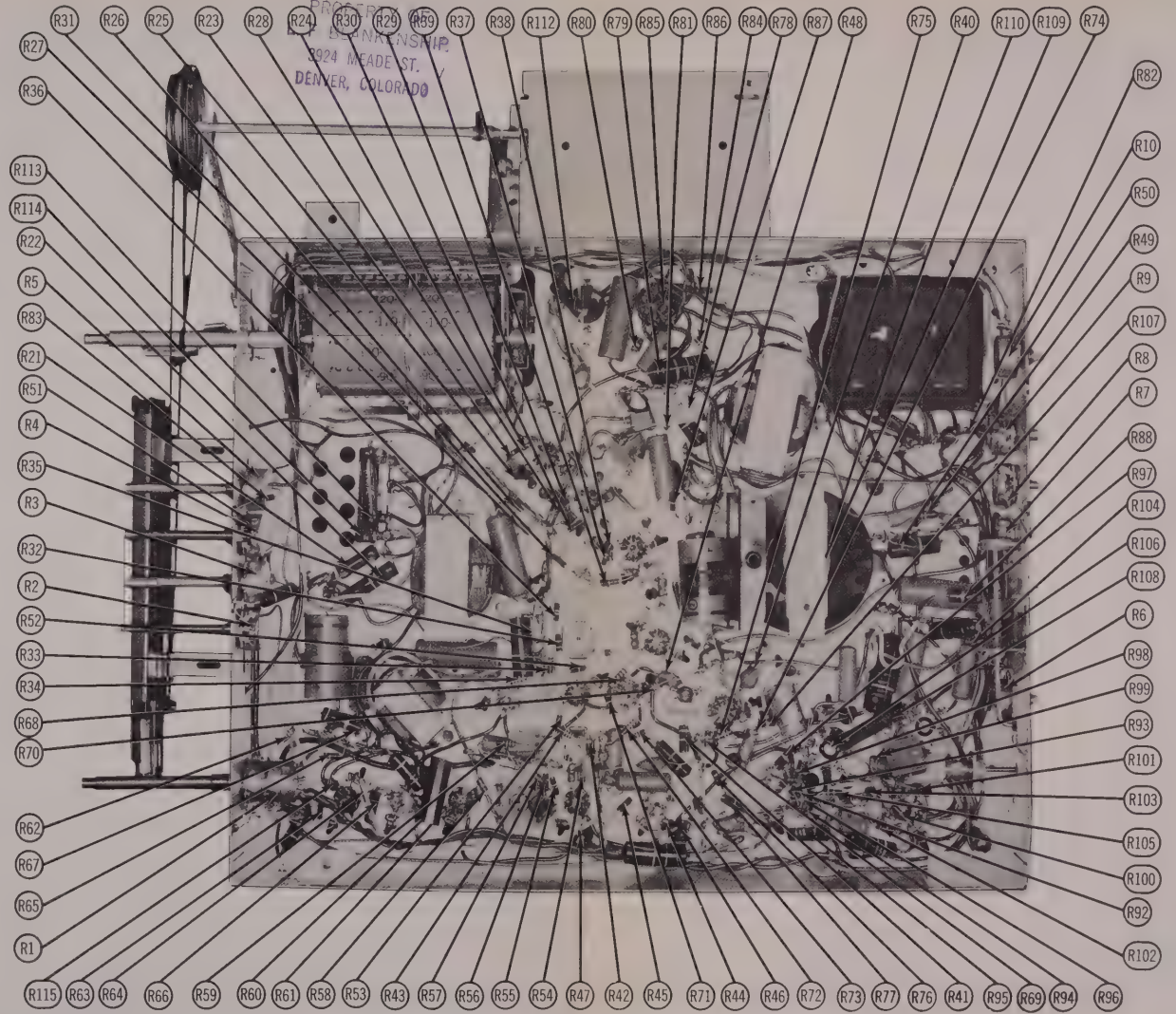
One fuse is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of the picture tube located flush against the yoke. Turn the disk-like knob and at the same time rotate the ring around the tube until picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 2 wood and 2 metal screws. Remove rear cover.
3. Disconnect VHF built-in antenna. Loosen 4 wood screw. Remove VHF and UHF antenna bracket.
4. Disconnect speaker. Remove 4 speaker nuts. Remove speaker.
5. Remove 5 chassis bolts. Remove chassis.



PROPERTY OF
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DENVER, COLORADO

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

CBS-COLUMBIA
MODELS 525, 526

CBS-COLUMBIA
MODELS 525, 526

TRADE NAME	CBS-Columbia Models 525, 526
MANUFACTURER	CBS-Columbia, Inc., 3400 47th Ave., Long Island City, 1, N.Y.
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC-DC (or) 7½ Volts "A" Supply & 67½ Volts "B" Supply
RATING	.15 Amp. @ 117 Volts AC (or) 60MA @ 7½ Volts DC & 13MA @ 67½ Volts DC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3; A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1600KC	1600KC	"	A5	"
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

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PARTS LIST AND DESCRIPTIONS

CBS-COLUMBIA MODEL 525

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CBS Columbia PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CBS Columbia PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	60	150							R1423	Red
B	60	150								Yellow
C	100	25								Green
C2	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C4	.01	200		BPD-01	D6-103	TM5S1	GP2-333-103	DC5I1	4TM-S1	
C5	100	500		1469-0001	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C6	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C7	.001			BPD-001	D6-102	TM5D1	GP2L-102	UC521	5GA-D1	Note 1
C8A	.0075								PA-19157	
B	125									
C	2000									
D	1000									
C9	.05	400		P488-05		PJ4S5		PT415	4TM-S5	

Note 1: Some Models may use a 1500MMF capacitor in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CBS Columbia PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	PA-2495	Q13-139	AG-66-Z	AB-76	U-55	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	KB-2	US-27	Attach to R1A

RESISTORS

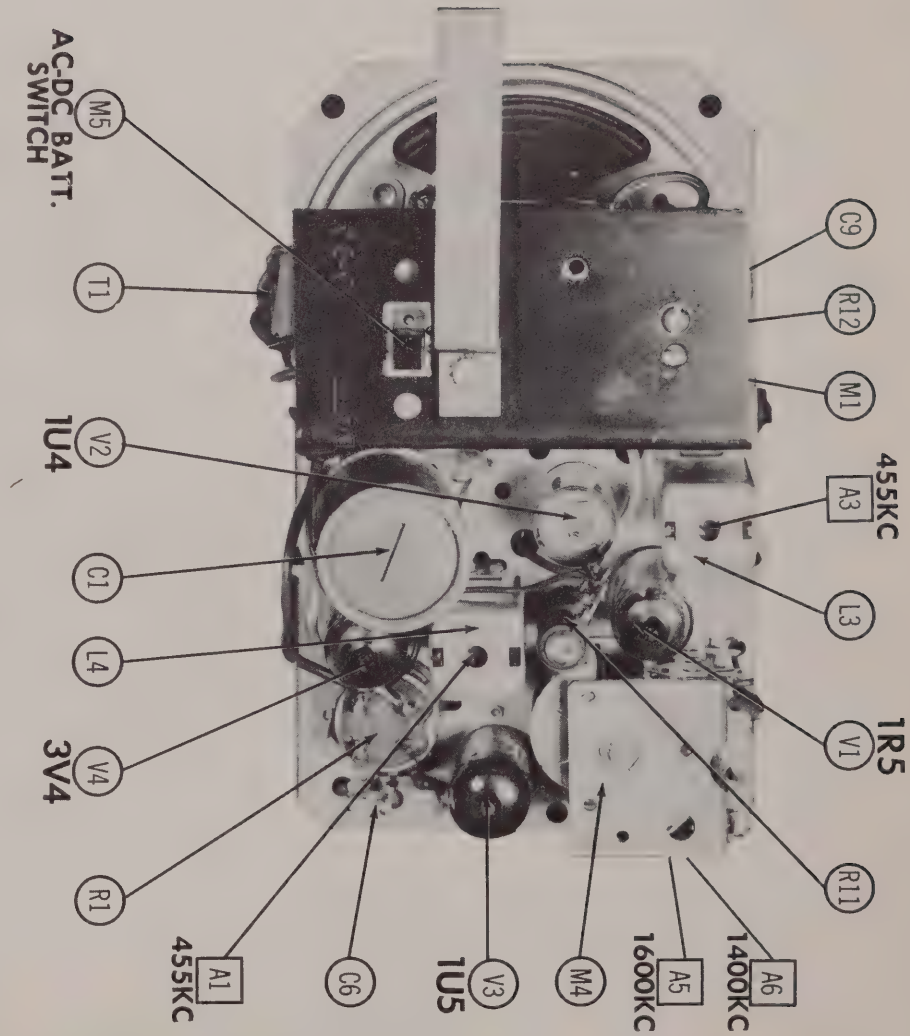
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CBS Columbia PART No.	IRC PART No.	NOTES
R2	100KΩ	½		BTS-100K	
R3	3.3Meg	½		BTS-3.3Meg	
R4	100KΩ	½		BTS-100K	
R5	10Meg	½		BTS-10Meg	
R6	3.3Meg	½		BTS-3.3Meg	
R7	820KΩ	½		BTS-820K	
R8	3.3Meg	½		BTS-3.3Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CBS Columbia PART No.	IRC PART No.	NOTES
R9	180Ω	½		BTS-180	
R10	680Ω	½		BTS-680	
R11A	1500Ω	10			
B	750Ω				
R12	47Ω	2			
R13	4700Ω	½		BTS-4700	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: CBS Columbia PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	11KΩ	3.3Ω	550Ω	.55Ω	7564-1				S-11X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CBS Columbia PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	PB-58126	ST-113 Mod. P4-X	4A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CBS Columbia PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.3Ω						
L2	Osc. Coil	2.5Ω	10Ω		14-1073		69-Osc.*	
L3	Input IF	25Ω	25Ω	PA3398	16-6758	BC-352	12-C1	
L4	Output IF	26Ω	26Ω	PA3398	16-6758	BC-353	12-C2	

* Drill mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	CBS Columbia PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.064ADC	PA-51160	NB5	5M4	1003A	6S75	75

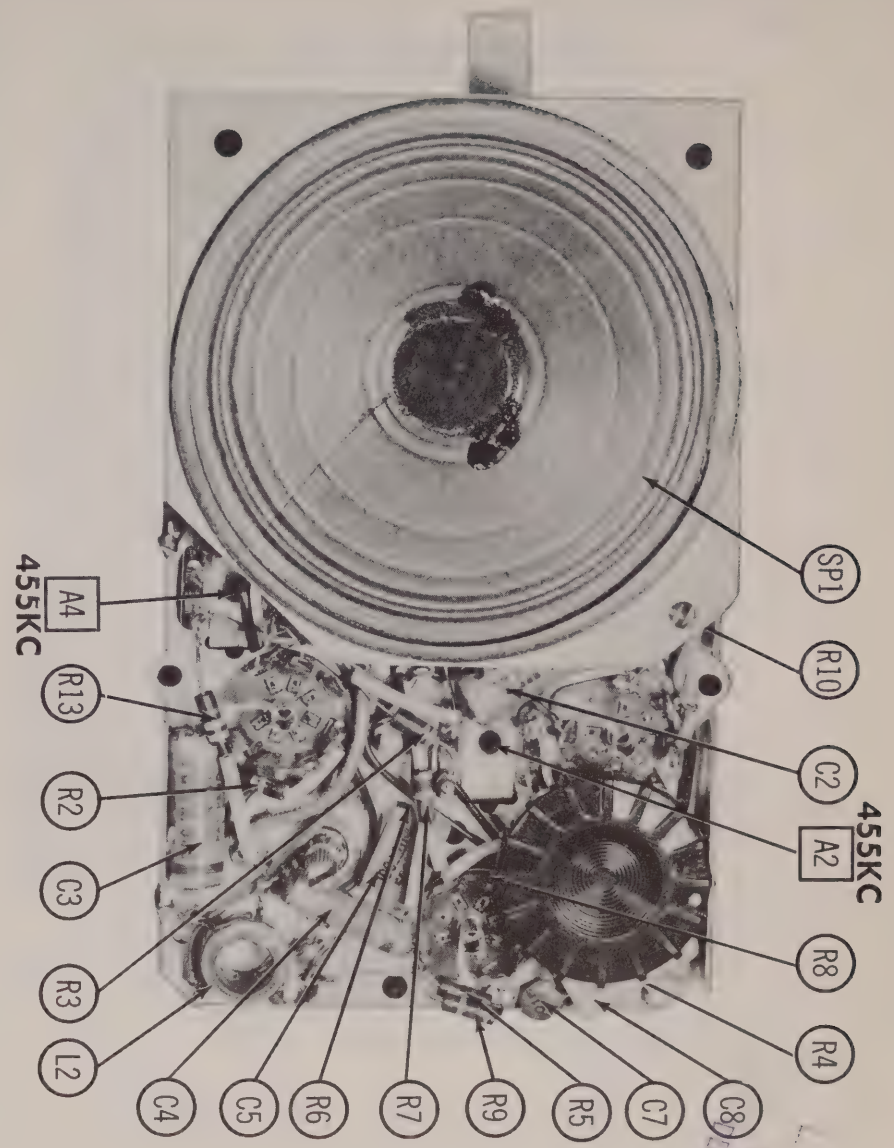
BATTERIES

ITEM No.	VOLTAGE	CBS Columbia PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	7½ "A"		713			B5			
M3	67½ "B"			467			XX45		

MISCELLANEOUS

ITEM No.	PART NAME	CBS Columbia PART No.	NOTES
M4	Tuning Capacitor	PB16113	2 Section (23-355MMF, 19-145MMF)
M5	Switch		Battery AC/DC Selector

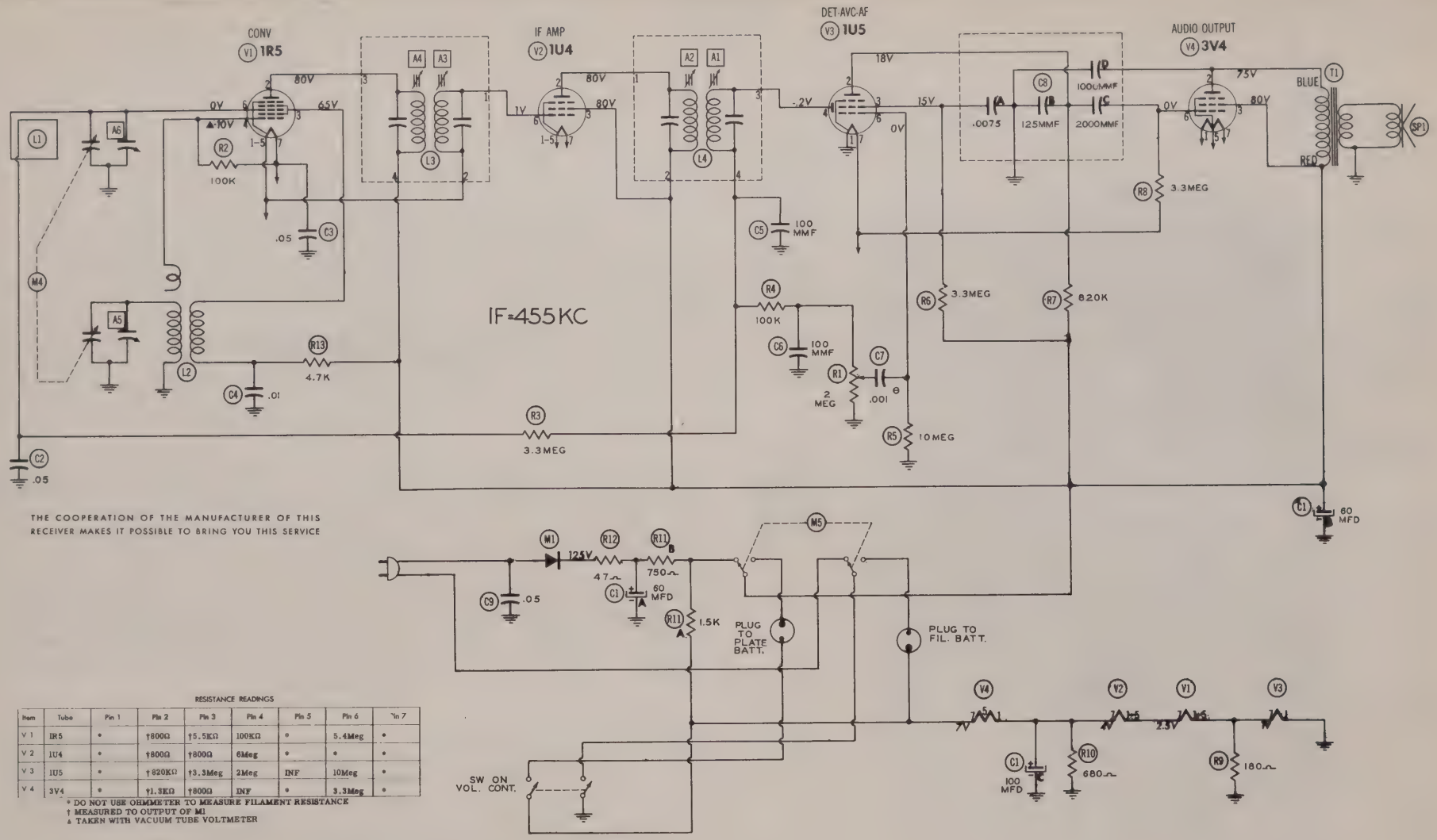
CHASSIS—BOTTOM VIEW



SET 222 FOLDER 4

CBS COLUMBIA MODEL 525

CBS-COLUMBIA MODEL 525



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	•	†800Ω	†5.5KΩ	100KΩ	•	5.4Meg	•
V 2	1U4	•	†800Ω	†800Ω	6Meg	•	•	•
V 3	1U5	•	†820KΩ	†3.3Meg	2Meg	INF	10Meg	•
V 4	3V4	•	†1.3KΩ	†800Ω	INF	•	3.3Meg	•

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED TO OUTPUT OF M1
▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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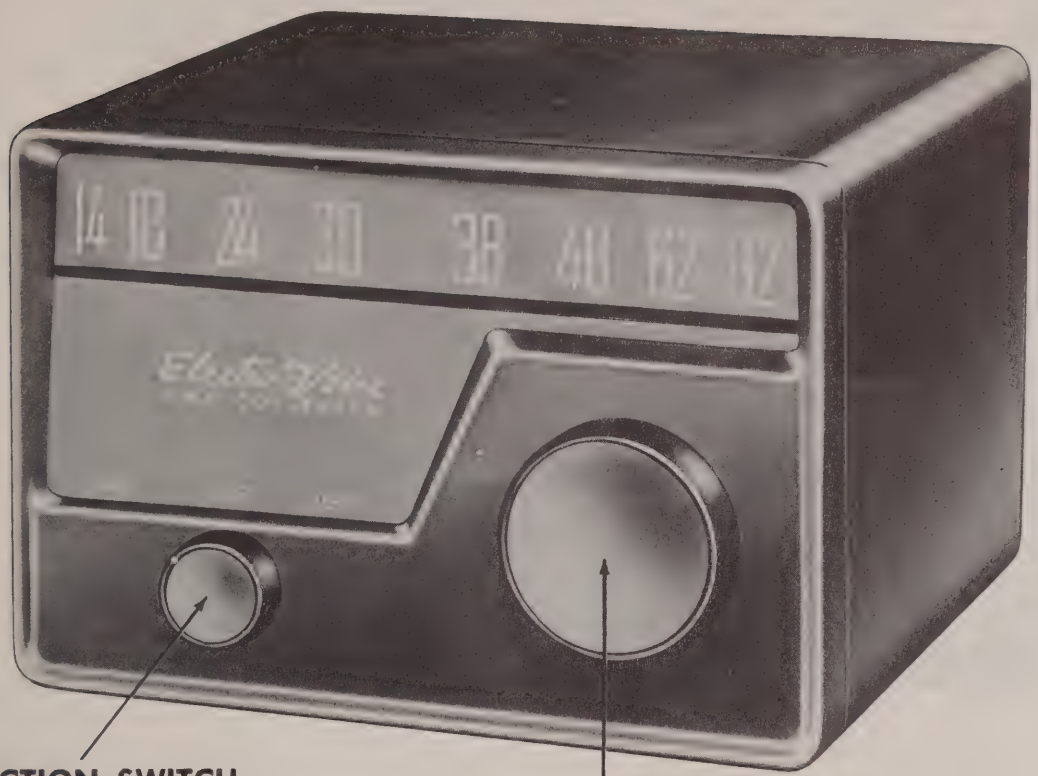
222-4

1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

PROF...
L. F. D...
3924 MEADE ST.
DENVER, COLORADO

ELECTRO-VOICE
3300 UHF Conv.



ELECTRO-VOICE
3300 UHF Conv.

TRADE NAME	Electro-Voice Model 3300
MANUFACTURER	Electro-Voice, Inc., Buchanan, Mich.
TYPE SET	AC Operated UHF Converter
TUBES (Two)	Types 6T4 (or) 6AF4 UHF Osc., 6BC5 IF Amp.
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .16 Amp. @ 117 Volts AC
TUNING RANGE	Channels 14 thru 83

THIS EQUIPMENT HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT SHOULD NOT BE REQUIRED IN THE FIELD.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ELECTRO-VOICE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1A	UHF Oscillator	6T4	6T4	7DK	
B	UHF Oscillator	6AF4	6AF4	7DK	
V2	IF Amplifier	6BC5	6BC5	7BD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ELECTRO-VOICE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PRS150/40-		BRD4415A		TCD48	TVA-2445	
B	40	150		40						
C2	.68				TCZ-.68		NP0K-R68			
C3	.68				TCZ-.68		NP0K-R68			
C4	2.2			SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C5	1-4				829-4					
C6	2.2			SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C7	.68				TCZ-.68		NP0K-R68			
C8	1-4				829-4					
C9	68			SI68NP0	TCZ-68		NP0L-680		5TCC-Q68	
C10	68			SI68NP0	TCZ-68		NP0L-680		5TCC-Q68	
C11	68			SI68NP0	TCZ-68		NP0L-680		5TCC-Q68	
C12	3.3			SI3.3NP0	TCZ-3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C13	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C14	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ELECTRO-VOICE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R1	3300Ω	½		BTS-3300	
R2	150Ω	½		BTS-150	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ELECTRO-VOICE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R3	680Ω	1		BTA-680	
R4	47KΩ	½		BTS-47K	Note

Note: Not used in all Models.

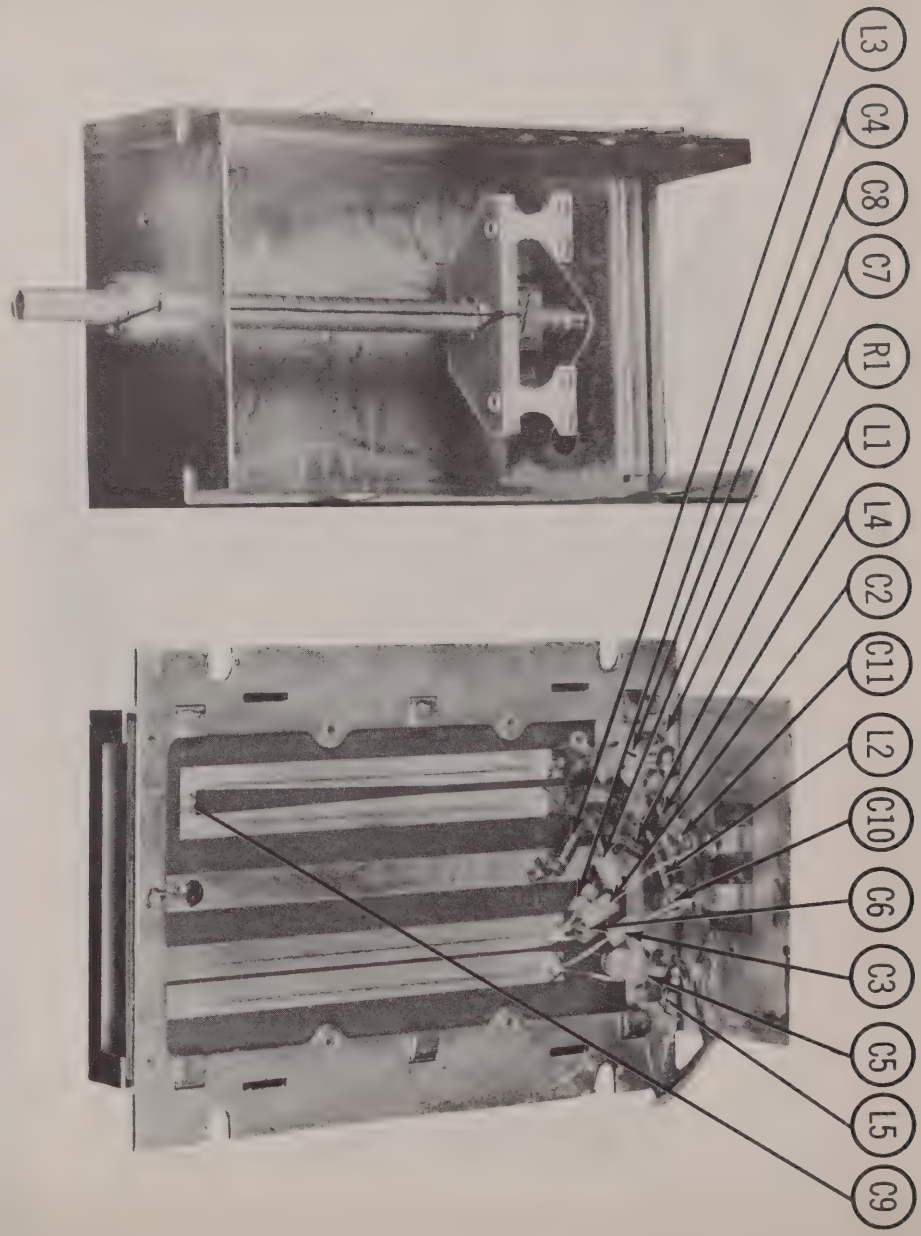
TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: ELECTRO-VOICE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @.16A	100V .038ADC	6.3VAC @1.07A						

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: ELECTRO-VOICE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Fil. Choke	.2Ω						
L2	Fil. Choke	.2Ω						
L3	Cathode Choke	0Ω						
L4	RF Choke	0Ω						
L5	IF Coupling	0Ω						Tapped
L6	IF Input Coil	0Ω						
L7	IF Output Trans.	0Ω	0Ω					

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

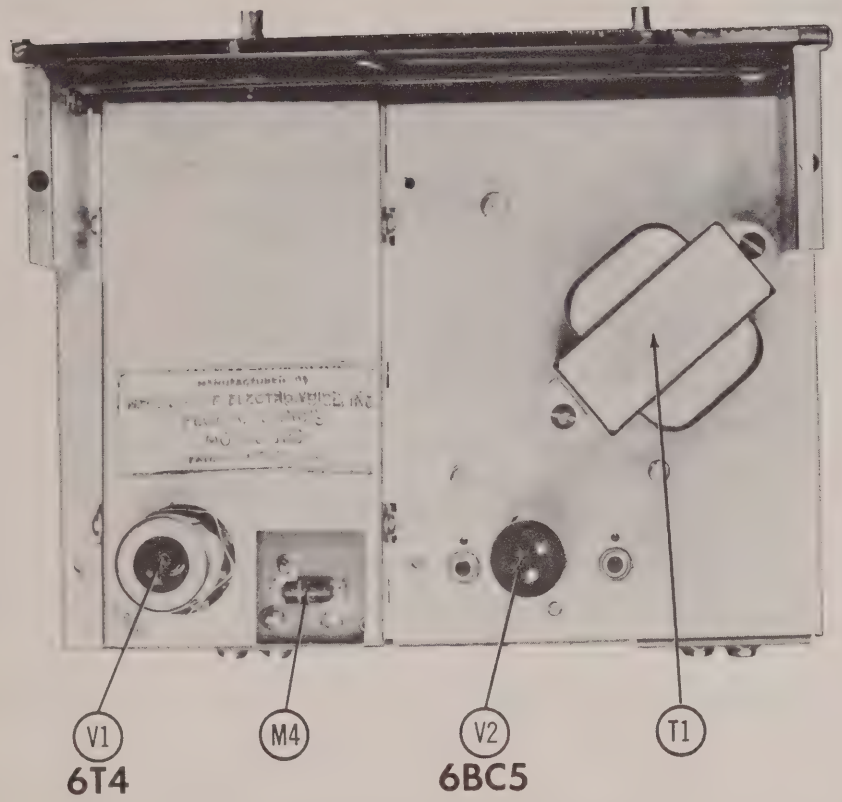
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	ELECTRO-VOICE PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.038ADC		NA5 ①	8J1 ①	1002A ①	6S65 ①	65 ①

① Drill new mounting hole.

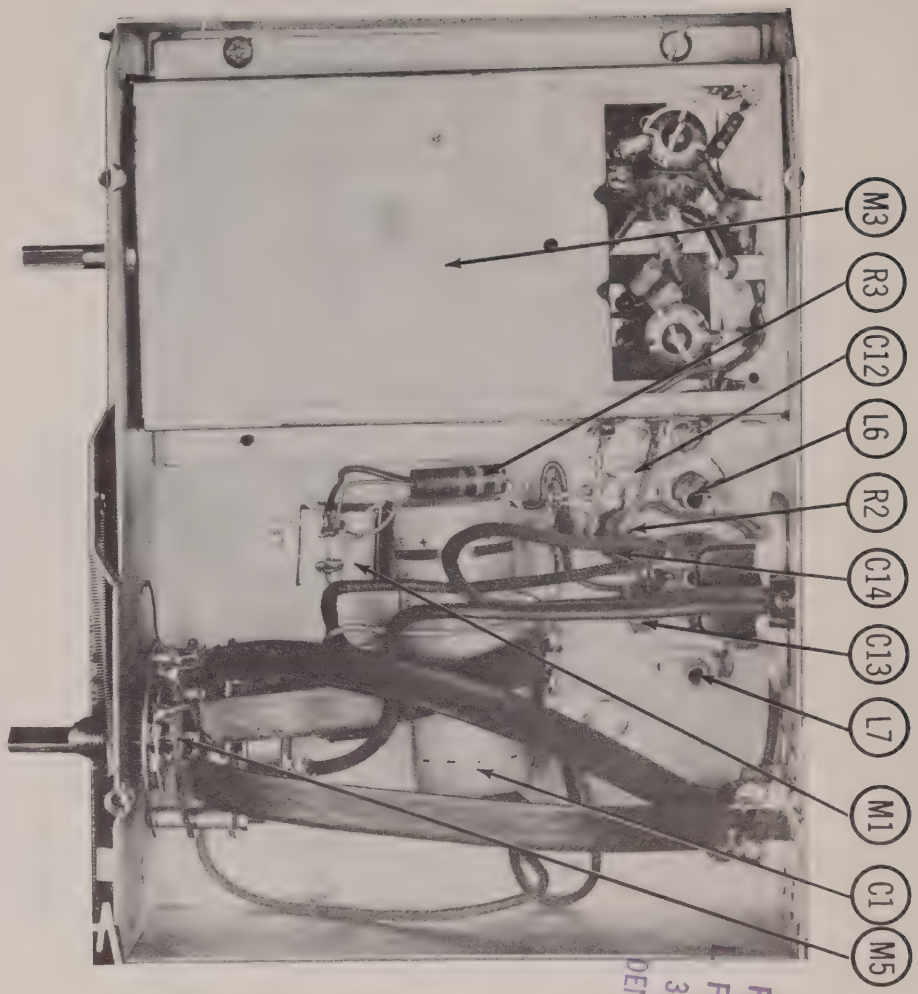
MISCELLANEOUS

ITEM No.	PART NAME	ELECTRO-VOICE PART No.	NOTES
M2	Pilot Light		Type #NE2 (Not used in all Models.)
M3	RF Tuner		
M4A	Crystal Diode		UHF Mixer (Type 1N72)
B	Crystal Diode		UHF Mixer (Type CK710)
C	Crystal Diode		UHF Mixer (Type 1N82)
M5	Switch		Off/VHF/UHF Selector



CHASSIS—TOP VIEW

CHASSIS—BOTTOM VIEW



PROPERTY OF
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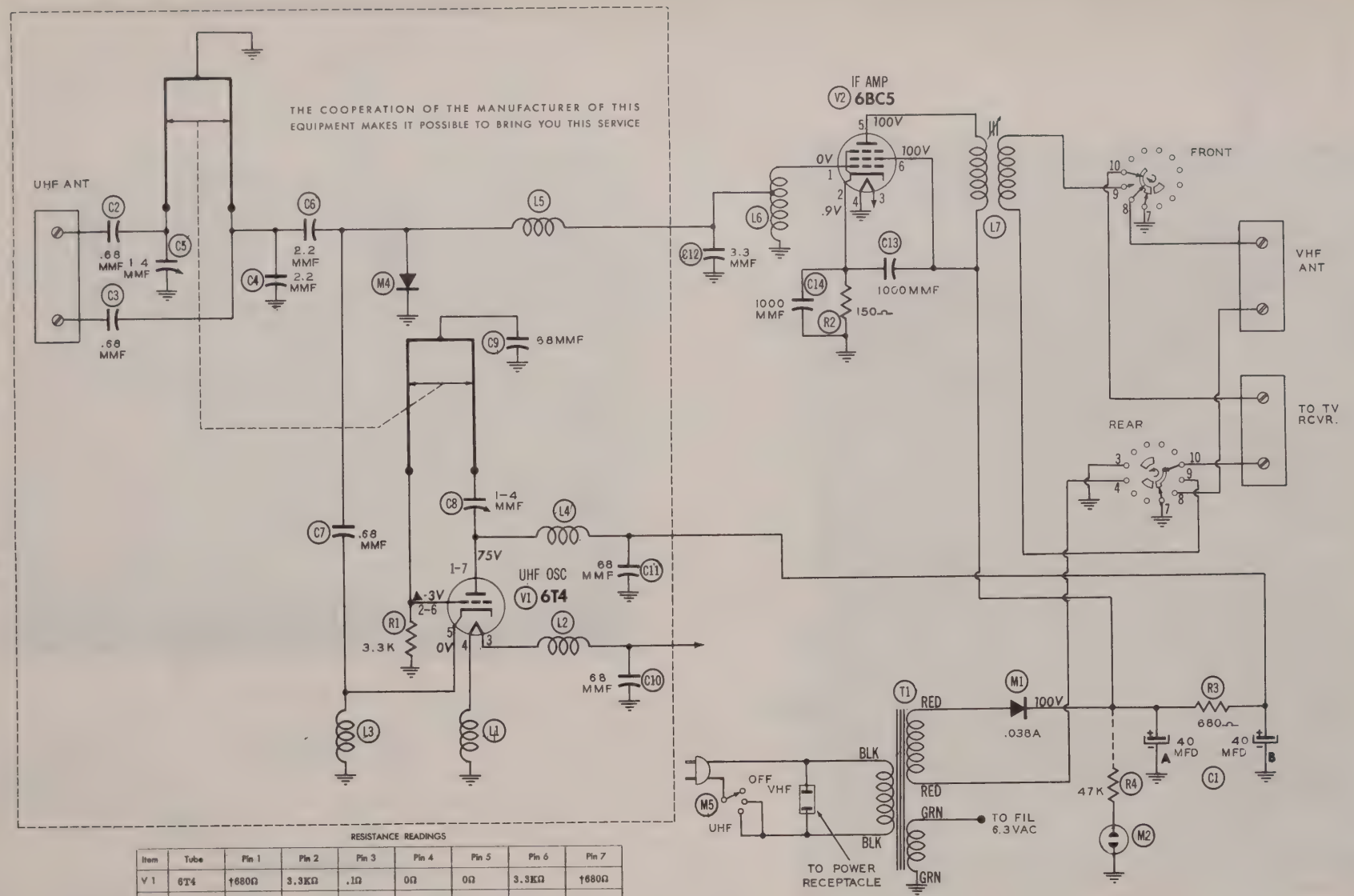
3924 MEADE ST.
DENVER, COLORADO

ELECTRO-VOICE
MODEL 3300



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6T4	†680Ω	3.3KΩ	.1Ω	0Ω	0Ω	3.3KΩ	†680Ω
V 2	6BC5	0Ω	150Ω	.1Ω	0Ω	†0Ω	†0Ω	150Ω

ALL MEASUREMENTS TAKEN WITH SWITCH IN UHF POSITION
▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM OUTPUT OF M1.

222-5

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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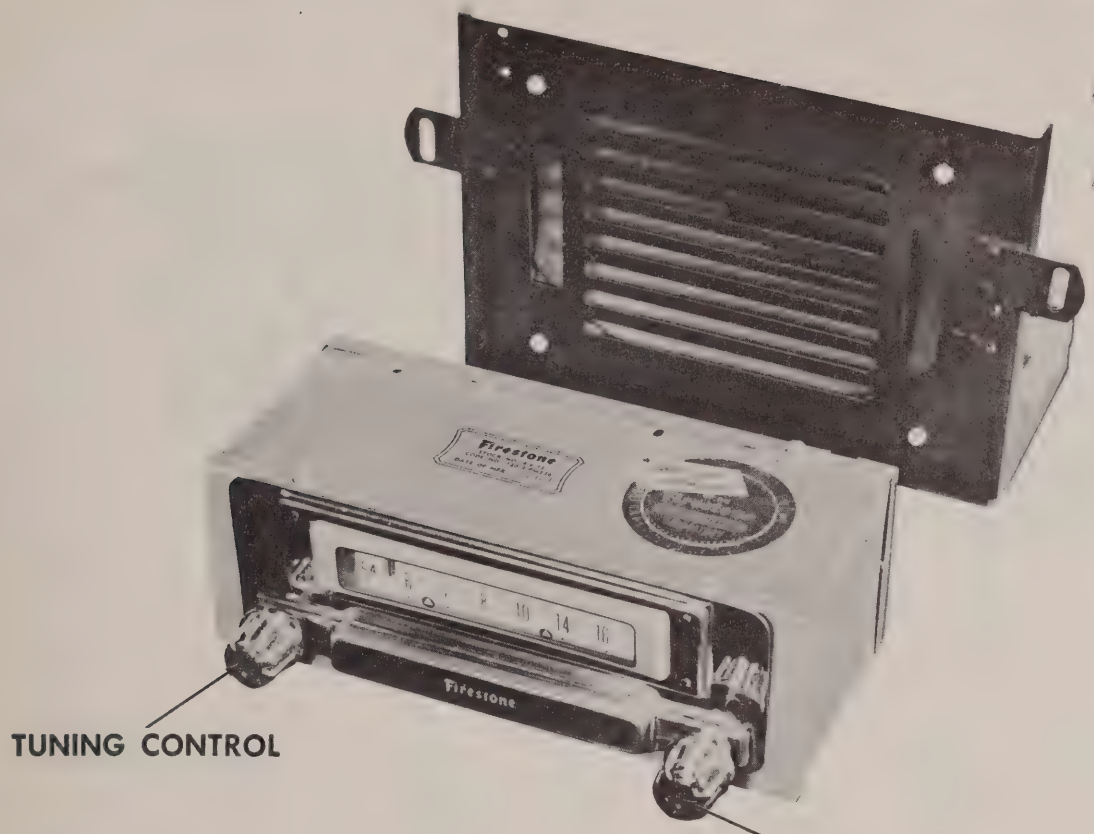
1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 Volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.

L F [illegible] DE
392[illegible] ST
DENVER, COLORADO

FIRESTONE
MODEL 4-B-71



FIRESTONE
MODEL 4-B-71

TRADE NAME	Firestone Model 4-B-71 (Code 120-3-PM236) (For 1953 Plymouth Automobiles)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Pkwy., Akron, Ohio
TYPE SET	Battery Operated AM Superheterodyne Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 or 6AV6 Det.-AVC-AF Amp., 6V6GT Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.9 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	538-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~Mod)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum deflection.
2.	68MMF	High side to antenna receptacle. Low side to chassis.	1610KC	"	"	A5	"
3.	"	"	1400KC	Tune to 1400KC signal	"	A6, A7	"
4.	With radio installed in car and antenna fully extended tune to a weak station near 1400KC and adjust A7 for maximum volume.						
	Tune to low frequency end stop and set pointer to last low frequency index mark on the dial.						

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		FIRESTONE PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4A	Det.-AVC-AF Amp.	6AT6	6AT6	7BT	
B	Det.-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	Audio Output	6V6GT	6V6GT	7S	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	350	CE-86	AFH3-109		CO80		FP345.8	TVL-3678	
B	▲20	350								
C	20	25								
C2	.05	200	C-503-2	P288-05	DF-503	PTE4S5		PT415	2TM-S5	
C3	100		CC-101	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C4	.006	400	C-602-4	P688-005	D6-502	PTE6D5	GP2-333-602	PT626	6TM-D6	
C5	.05	200	C-503-2	P288-05	DF-503	PTE4S5	GP1K-050	PT415	2TM-S5	
C6	5		CC-50	SI5				ZT-555	5GA-V5	
C7	40		CC-400	SI40	D6-400					
C8A	220									
B	5000									
C	250 *		*PC-151	*PA-113-2	*PC151		*1408-02		*103C5	
D	5000									
E	250*									
C9	.01	600	C-103-6	P688-01	DD-1032	PTE6S1	GP2-333-103	PT611	6TM-S1	
C10	.005	200	C-502-2	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C11	.47	100	C-504-1	VHC-36		MP2P5		RF480	2TM-P5	
C12	.008	1600	C-802-16	VBC-26		PTE1608		PT1628	MB-D8	
C13	.47	100	C-504-1	UHC-36		MP2P5		RF480	2TM-P5	

* Items C8A, C8B, C8C, C8D, C8E, R9A, R9B, R9C are combined in one unit.
When replacing items separately items C8C and C8E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FIRESTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	750KΩ	½	RV-57	Q13-137	AG-79-Z	B-70-S	U-51	Volume-See Note
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

Note: Some Models may use an alternate control (part #RV-132)

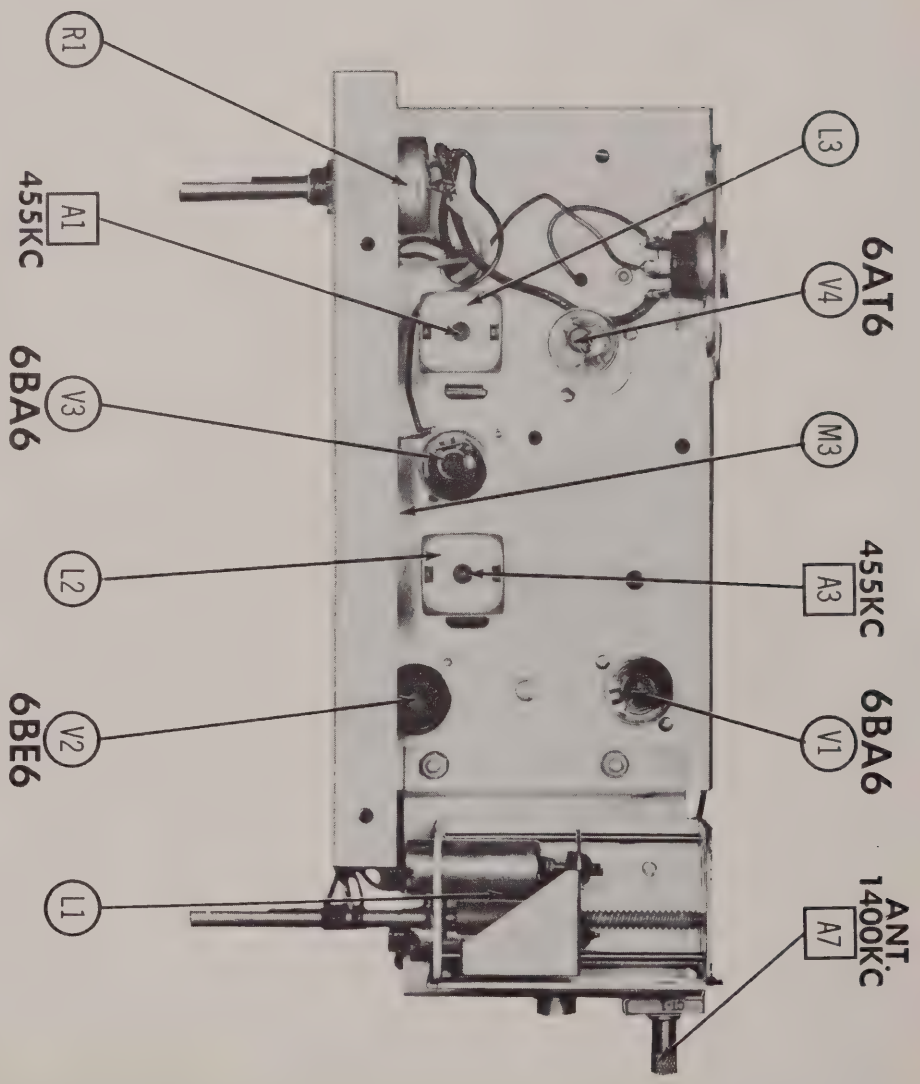
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R2	470KΩ	½	R474	BTS-470K	
R3	150Ω	½	R151	BTS-150	Note 1
R4	150KΩ	½	R154	BTS-150K	
R5	47KΩ	½	R473	BTS-47K	
R6	1500Ω	½	R152	BTS-1500	Note 2
R7	6800Ω	2	R682-2	BTB-6800	
R8	2.2Meg	½	R225	BTS-2.2Meg	Note 3

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R9A	6.8Meg	½	*PC-151	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R10	470KΩ	½	R474	BTS-470K	
R11	330Ω	½	R331	BTS-330	
R12	1000Ω	1	R102-1	BTA-1000	
R13	100Ω	½	R101	BTS-100	
R14	100Ω	½	R101	BTS-100	

Note 1. Some Models may use a 220Ω resistor in this application.
Note 2. Some Models may use a 1000Ω resistor in this application.
Note 3. Some Models may use a 2Meg resistor in this application.
* Items R9A, R9B, R9C, C8A, C8B, C8C, C8D, C8E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VAC @2A	430VCT .046ADC			TV-100		P-2971	VT-1 ①	V-16K

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	5KΩ	3.2Ω	370Ω	.54Ω	Part of Spkr.	A-3877	A-2930	RO-9 ①	S-3X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	FIRESTONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6 x 9"	PM	3.2Ω	PM-900	ST-810 Mod. P69-V	69A3	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1A	Ant. Coil	13Ω						Part of tuner assy. (tuner part #PT-500)
B	RF Coil	13Ω						Part of tuner assy. (tuner part #PT-500)
C	Osc. Coil	.5Ω	2.6Ω					Part of tuner assy. (tuner part #PT-500)
L2	Input IF	18Ω	18Ω	1655-16	16-6758	BC-352	12-C1	
L3	Output IF	18Ω	18Ω	1655-16	16-6758	BC-353	12-C2	
L4	Fil. Choke	0Ω		L203			5221	1.5 Microhenries
L5	Vibrator Hash Choke	0Ω		L202			5221	4 Microhenries

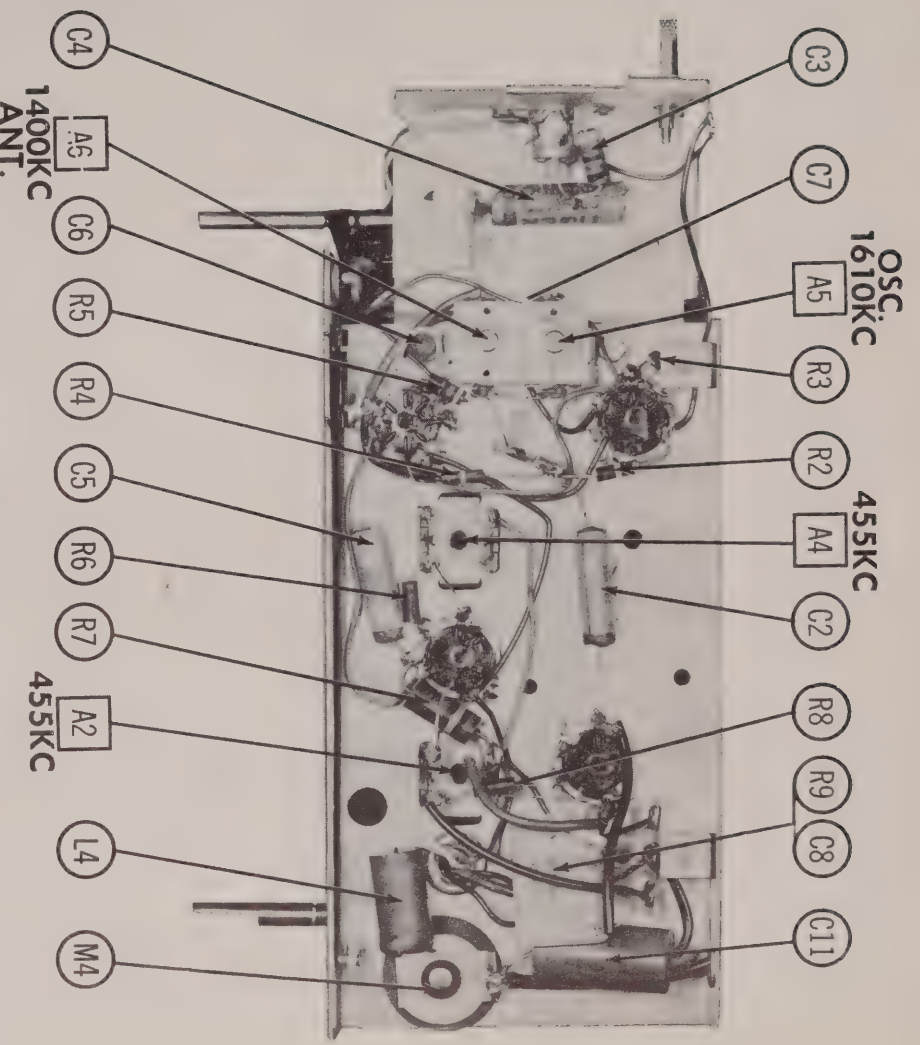
VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FRE-QUENCY	REPLACEMENT DATA				NOTES
				FIRESTONE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115v	V-83	5301	859	5301	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FIRESTONE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	14A	A200	FH226 (Includes lead assy.)	307014 (14A-SFE)	155014	SFE14	HD1

CHASSIS—BOTTOM VIEW

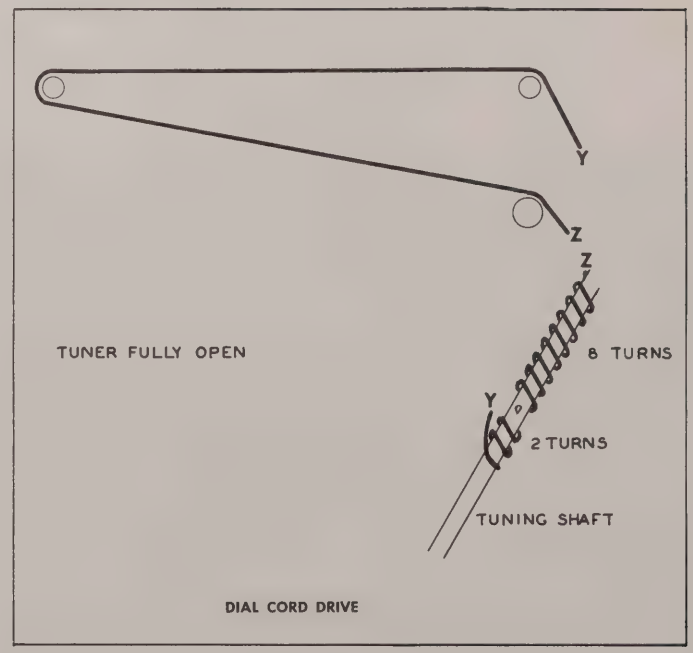


PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M3	Dial Light	T47	Type #47
M4	Spark Plate		
M5	Switch	SS-1	Bass-Treble Slide Switch
A5	Trimmer Cap.	CT-3	Osc. Trimmer
A6	Trimmer Cap.	CT-2	RF Trimmer
A7	Trimmer Cap.	CT-1	Antenna Compensator
	"A" Lead Assy.	FH226	Includes fuse holder
	Knob	H310E	Off/On/Volume-Tuning (2 used)
	Dial Scale	DP150	

CHASSIS—BOTTOM VIEW



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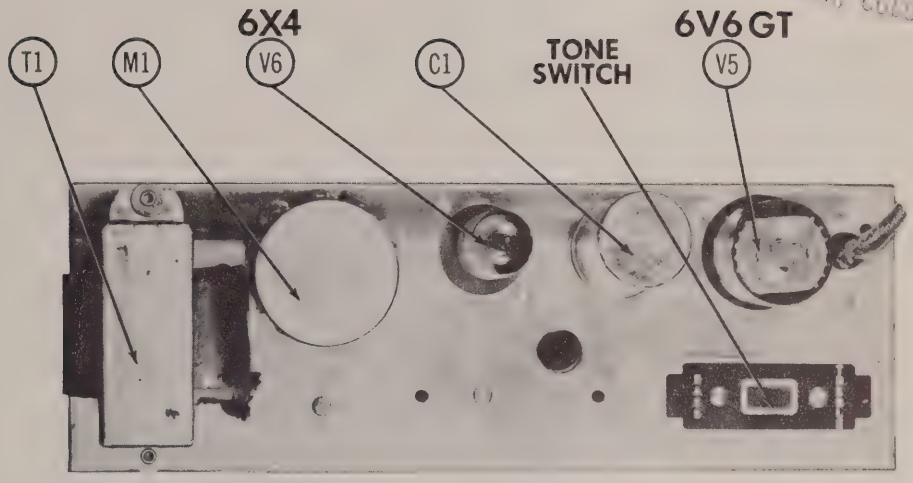

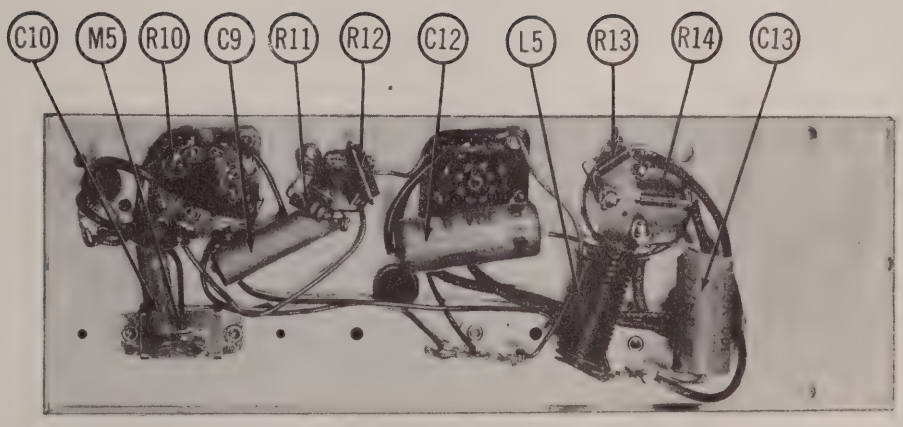

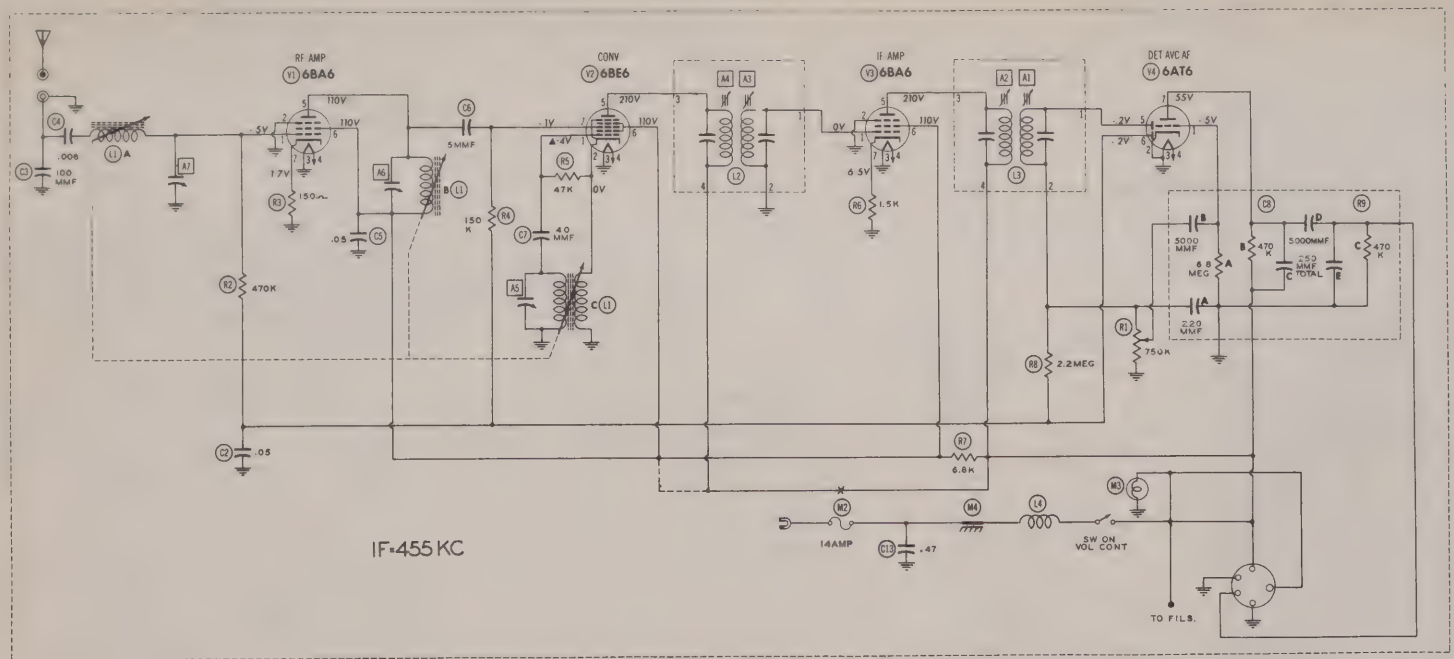

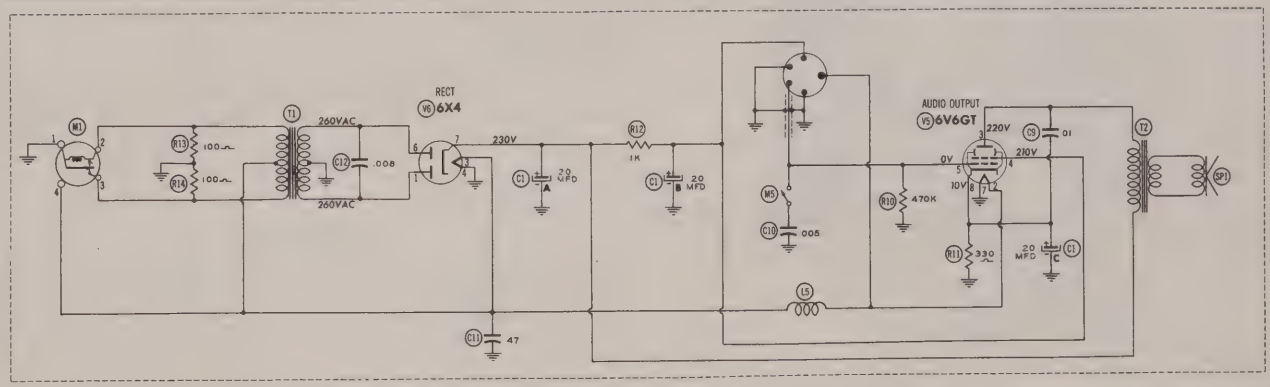

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	3.5Meg	0Ω	0Ω	.4Ω	*6.9KΩ	*6.9K	150Ω	
V 2	6BE6	47KΩ	.5Ω	0Ω	.4Ω	*1KΩ	*6.9KΩ	3.8Meg	
V 3	6BA6	1TΩ	0Ω	0Ω	.4Ω	*1KΩ	*6.9KΩ	1.5KΩ	
V 4	6AT6	470KΩ	0Ω	0Ω	.4Ω	750KΩ	2.8Meg	*470KΩ	
V 5	6V6	INF	.4Ω	*370Ω	*1KΩ	470KΩ	INF	0Ω	330Ω
V 6	6X4	385Ω	INF	.4Ω	0Ω	INF	400Ω	3Meg	

*MEASURED FROM PIN 7 OF V6
▲TAKEN WITH VACUUM TUBE VOLTMETER

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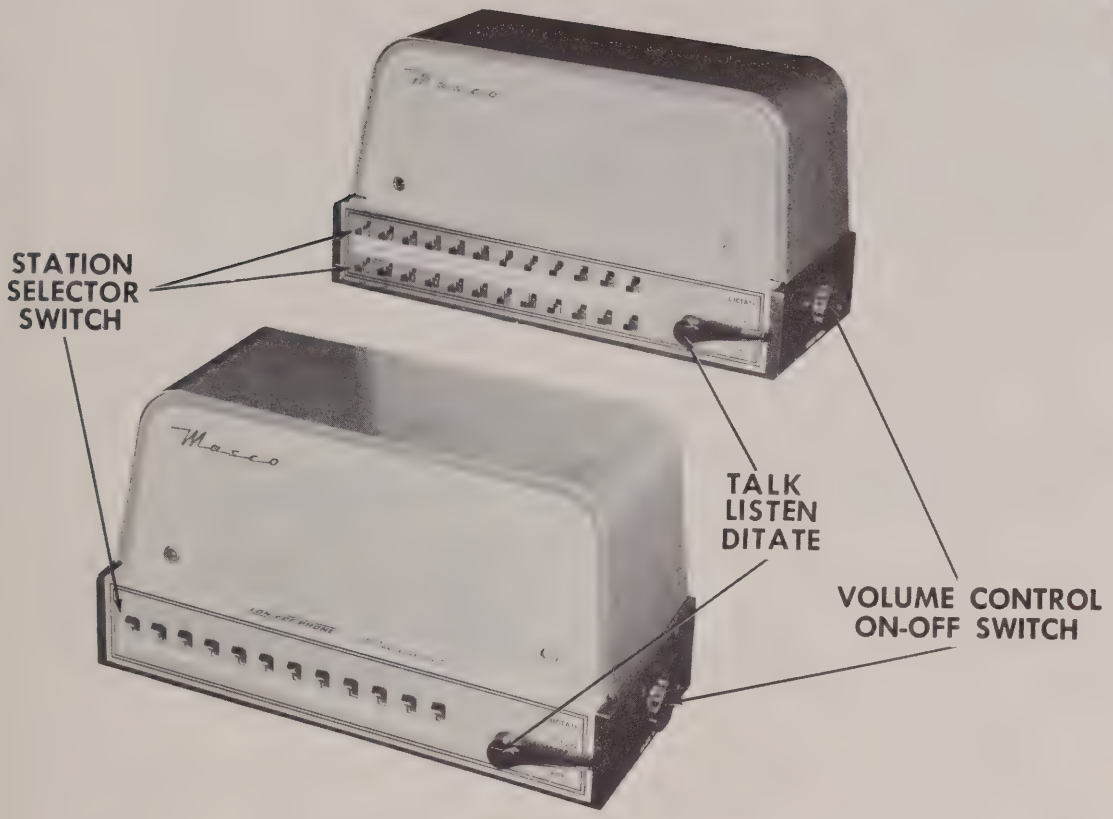
1 - DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO

MASCO
MODELS AC-12, AC-24, ACL, ACS, ACS-6



MASCO
MODELS AC-12, AC-24, ACL, ACS, ACS-6

TRADE NAME	Masco Models AC-12, AC-24 (master units), ACL, ACS, ACS-6 (Speaker units)
MANUFACTURER	Mark Simpson Mfg. Co., Inc., 32-28 49th St., Long Island City, N. Y.
TYPE SET	AC Operated 12 or 24 Channel Intercommunication System
TUBES (Four)	Types (2) 12AX7 AF Amp., 6V6GT Audio Output, 6X5GT Rectifier
POWER SUPPLY	110-120 Volts AC RATING .32 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

MASCO
MODEL AC-12

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		MASCO PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	12AX7	12AX7	9A	
V2	AF Amplifier	12AX7	12AX7	9A	
V3	Audio Output	6V6GT	6V6GT	7S	
V4	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MASCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲20	450		AFH4-14		DO13		FP444	TVL-4763	
B	■20	450								
C	10	450								
D	▲10	450								
C2	10	50		PRS50/10		BR105		TC32	TVA-1304	
C3	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C4	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C5	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C6	471			SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	Note 1
C7	.0047	600		P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C8	.0047	600		P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C9	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	

Note 1 Some models use .001MFD in this application

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MASCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	BA012-246	Q13-133	AG-60-Z	B-60-S	U-48	Outgoing volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	50Ω	2			A43-50†	VK-116†	R50L*	Incoming Volume-Wire Wound
B	Shaft				FKS-1/4	Not Req.	Not Req.	Attach to R2A

*Use Mallory Washers Nos. 203 & 212 to insulate control from chassis.
†Use original insulating washers.

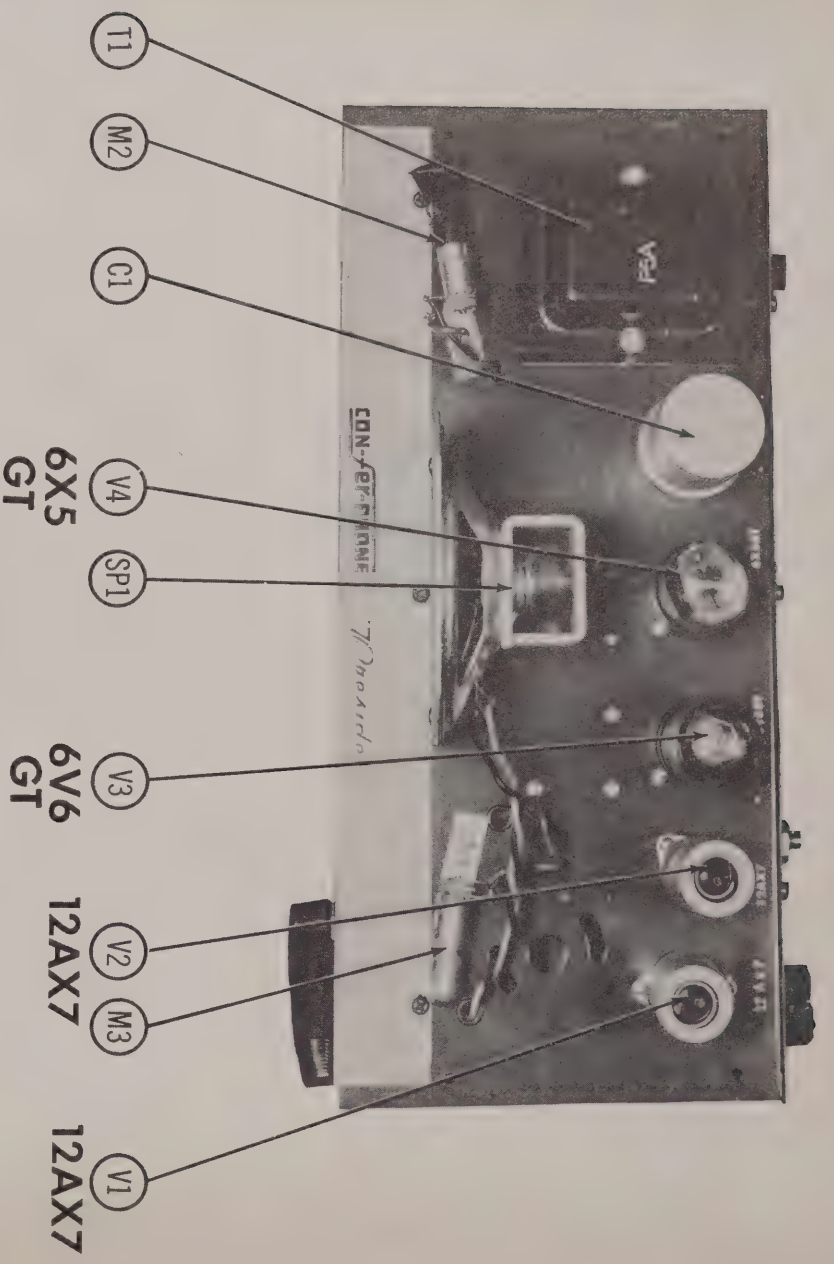
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MASCO PART No.	IRC PART No.	
R3	4300Ω	½			
R4	47Ω	2			
R5	33Ω	½		BTS-33	
R6	33Ω	½		BTS-33	
R7	270KΩ	½		BTS-270K	
R8	470KΩ	½		BTS-470K	
R9	3300Ω	½		BTS-3300	
R10	270KΩ	½		BTS-270K	
R11	10KΩ	½		BTS-10K	
R12	100KΩ	½		BTS-100K	
R13	2200Ω	½		BTS-2200	
R14	270KΩ	½		BTS-270K	
R15	10KΩ	½		BTS-10K	

Some models may use a 470KΩ resistor in this application.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MASCO PART No.	IRC PART No.	
R16	100KΩ	½		BTS-100K	
R17	330KΩ	½		BTS-330K	
R18	10KΩ	½		BTS-10K	
R19	27KΩ	½		BTS-27K	
R20	270KΩ	½		BRS-270K	Note
R21	270Ω	1		BTA-270	
R22	4700Ω	1		BTA-4700	
R23	270Ω	1		BTA-270	
R24	82Ω	1			
R25	82Ω	1			
R26	47Ω	½		BTS-47	
R27	10KΩ	½		BTS-10K	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @ .32A	500VCT .048ADC	6.3VAC @ 4A						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	4.8KΩ	45Ω	194Ω	3.1Ω SEC. 2 2.2Ω						

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MASCO PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	45Ω		ST-739	4AO7Z45	Used in Master Units
SP2	3½"	PM	45Ω		Mod. P4X	3A07Z45	Used in Remote Units

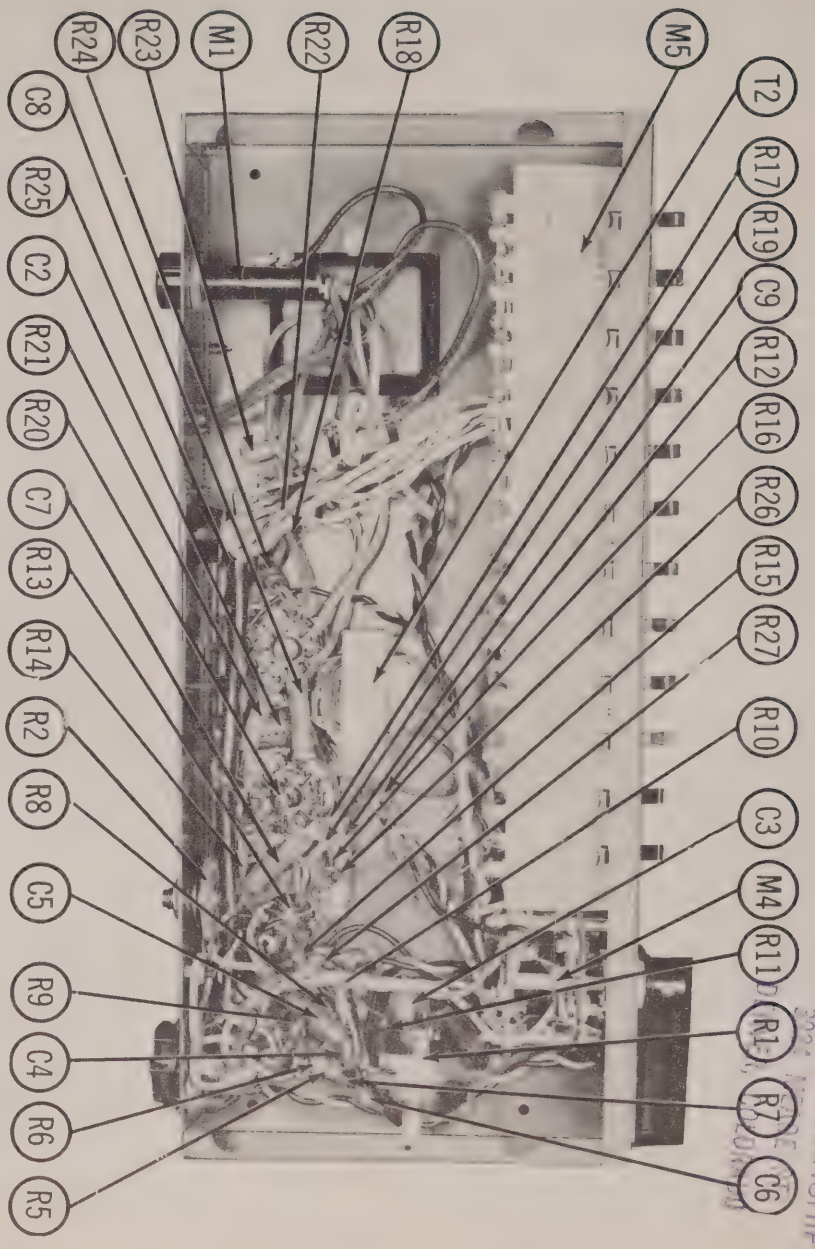
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MASCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1A @ 250V			312001.	341001	AGC1	HKP

MISCELLANEOUS

ITEM No.	PART NAME	MASCO PART No.	NOTES
M2	Pilot Lamp	27-PT-1085	Type #47.
M3	Indicator Lamp		Busy Signal (Type #NE51)
M4	Switch		"Press to talk"
M5	Switch		Station Selector (Consists of 12 or 24 DPST units)
M6	Handset		(Optional)

CHASSIS—BOTTOM VIEW



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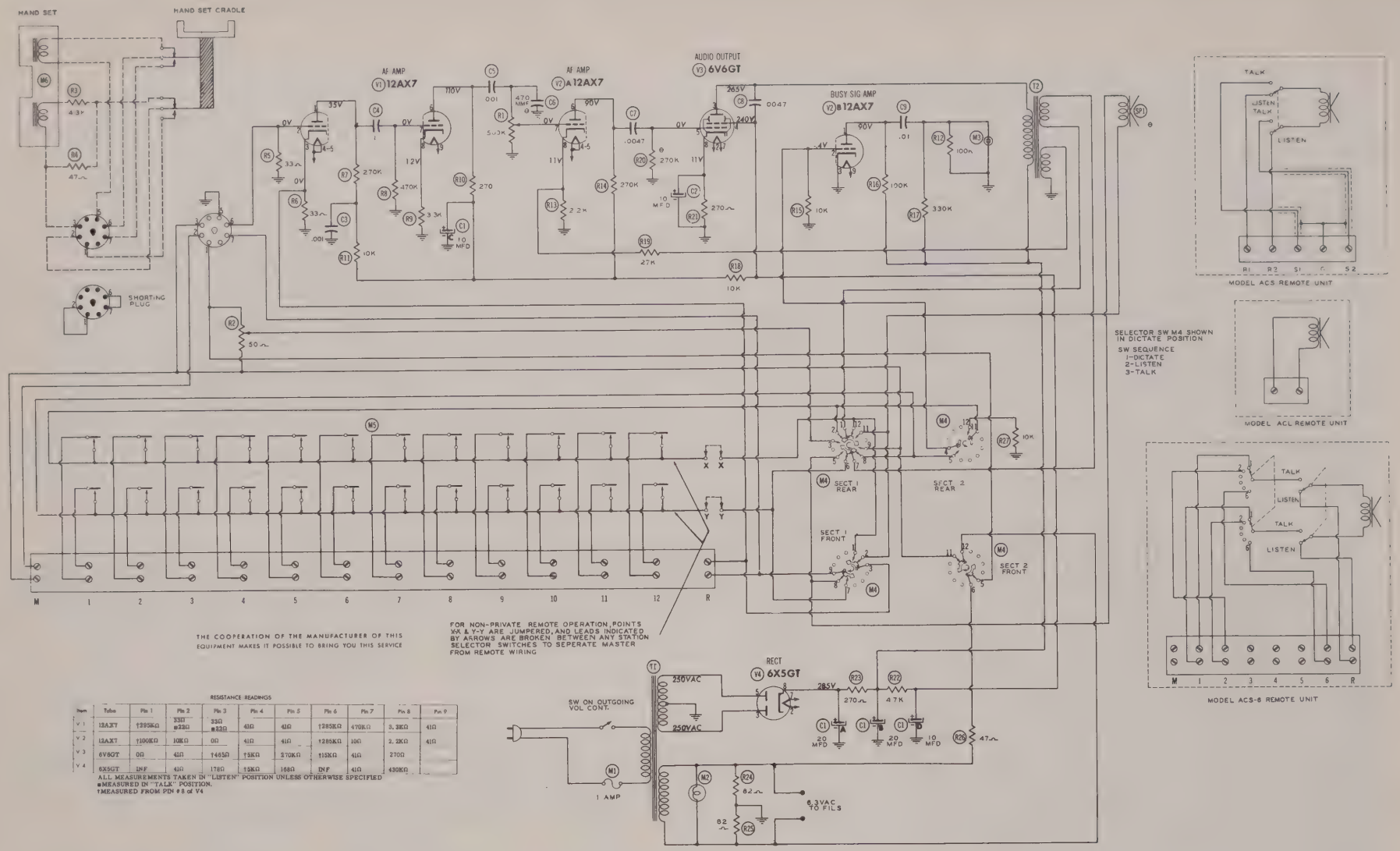
L. F. BLANKENSHIP

MASCO
MODEL AC-12



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†295KΩ	33Ω / ●23Ω	33Ω / ■23Ω	4ΩΩ	4ΩΩ	†285KΩ	470KΩ	3.3KΩ	4ΩΩ
V 2	12AX7	†100KΩ	10KΩ	0Ω	4ΩΩ	4ΩΩ	†285KΩ	100Ω	2.2KΩ	4ΩΩ
V 3	6V6GT	0Ω	4ΩΩ	†465Ω	†5KΩ	370KΩ	†15KΩ	4ΩΩ	270Ω	
V 4	6X5GT	INF	4ΩΩ	178Ω	†5KΩ	168Ω	INF	4ΩΩ	430KΩ	

ALL MEASUREMENTS TAKEN IN "LISTEN" POSITION UNLESS OTHERWISE SPECIFIED
●MEASURED IN "TALK" POSITION.
†MEASURED FROM PIN # 8 of V4

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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222-7

1 - DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

MOTOROLA
MODELS 63L1, 63L2, 63L3 (Ch. HS-361)

MOTOROLA
MODELS 63L1, 63L2, 63L3 (Ch. HS-361)

TRADE NAME	Motorola Model 63L1, 63L2, 63L3 (Ch. HS-361)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES(Five)	Types 1U4 RF Amp., 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC-DC (or) 9 Volts "A" Supply & 90 Volts "B" Supply in Pack Form
RATING	.15 Amp. @ 117 Volts AC (or) 50 MA @ 9 Volts DC & 14 MA @ 90 Volts DC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V2). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice Coil	A1, A2 A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	600KC	Tune to 600KC signal	"	A8	Adjust for maximum deflection while rocking tuning gang.
5.	Repeat Steps 2 and 3.						
6.	With chassis reassembled in cabinet and battery installed, readjust A7 for maximum output. A7 is accessible thru hole in cover.						
	With tuning gang fully closed set pointer to low frequency index mark on dial back plate.						

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PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL 63L1

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	1U4	1U4	6AR	
V2	Converter	1R5	1R5	7AT	
V3	IF Amplifier	1U4	1U4	6AR	
V4	Det-AVC-AF Amp.	1U5	1U5	6BW	
V5	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	100	150	23B611598	AFH3-196		XB006			R1363	
B	80	150				BRH1225A				
C	200	10								
C2	.05	400	8K471635	P488-05	DF-503	PTE4S5		PT415	2TM-S5	
C3	100		21R115639	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C4	10000		21R482726	BPD-01	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C5	100		21R115639	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C6	10		21R115884	SI10	D6-100		GP1K-100	UC-541	5GA-Q1	
C7	10000		21R482726	BPD-01	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C8	10000		21R482726	BPD-01	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C9A	2000									
B	150									
C	1000		*21B621535	*PA-136	*PC-165					
D	150									
E	5000									
C10	.002	400	8R4736	P488-002	D6-202	PJ6D2	GP2-333-202	PT622	6TM-D2	
C11	.02	100	8R9817	P488-02	DD-203	PJ2S2		PT412	2TM-S2	
C12	.05	100	8R9805	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C13	.05	100	8K71213	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C14	.1	200	8K490210	689ZX-.1		PJ2P1		PT401	2TM-P1	

* Items C9A, C9B, C9C, C9D, C9E and R13A, R13B, R13C, R13D are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	18A621584	Q13-137	AG-63-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

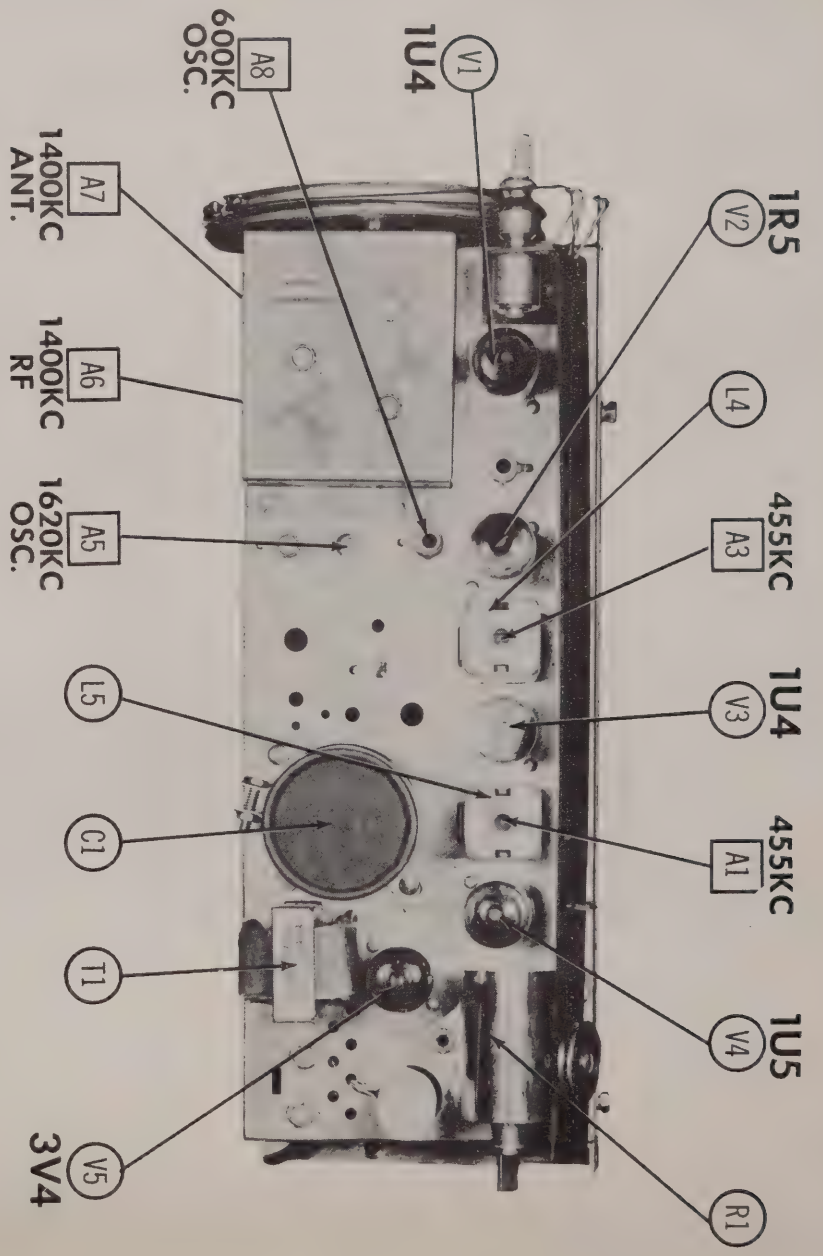
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	220KΩ	½	6R6015	BTS-220K	
R3	1Meg	½	6R6004	BTS-1Meg	
R4	5.6Meg	½	6R3988	BTS-5.6Meg	
R5	33KΩ	½	6R6012	BTS-33K	
R6	2.2Meg	½	6R3927	BTS-2.2Meg	
R7	100KΩ	½	6R6031	BTS-100K	
R8	27KΩ	½	6R6434	BTS-27K	
R9	1Meg	½	6R6004	BTS-1Meg	
R10	10Meg	½	6R2109	BTS-10Meg	
R11	1Meg	½	6R6004	BTS-1Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R12	1Meg	½	6R6004	BTS-1Meg	
R13A	10Meg	½		BTS-10Meg	
B	4.7Meg	½	*21B621535	BTS-4.7Meg	
C	1Meg	½		BTS-1Meg	
D	3.3Meg	½		BTS-3.3Meg	
R14	220Ω	½	6R6270	BTS-220	
R15	1000Ω	½	6R6229	BTS-1000	
R16	150Ω	2.5	17A76986		
R17	820Ω	½	6R6269	BTS-820	
R18	2000Ω	10	17B611589	1 3/4A-2000	

* Items R13A, R13B, R13C, R13D, C9A, C9B, C9C, C9D, C9E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	9.8KΩ	3.3Ω	400Ω	.42Ω	25B621570	A-3879 ①	A-2932 ①	RO-301 ①	S-11X ①	① Bend mounting tabs down, file out slots, mount on orig. mounting bracket.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6 x 9"	PM	3.3Ω	50D621712			

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2.4Ω		24K621595				
L2	RF Coil	7Ω	10.5Ω	24B611539				
L3	Osc. Coil	3.7Ω	1Ω	24B621561			71-Osc.	Sec. tapped @ 5Ω
L4	Input IF	25Ω	25Ω	24K600824	16-6758	BC-352	12-C1	
L5	Output IF	25Ω	25Ω	24K600824	16-6758	BC-353	12-C2	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	MOTOROLA PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.061ADC	48B478111	NB5	5M4	1003A	6S75	75

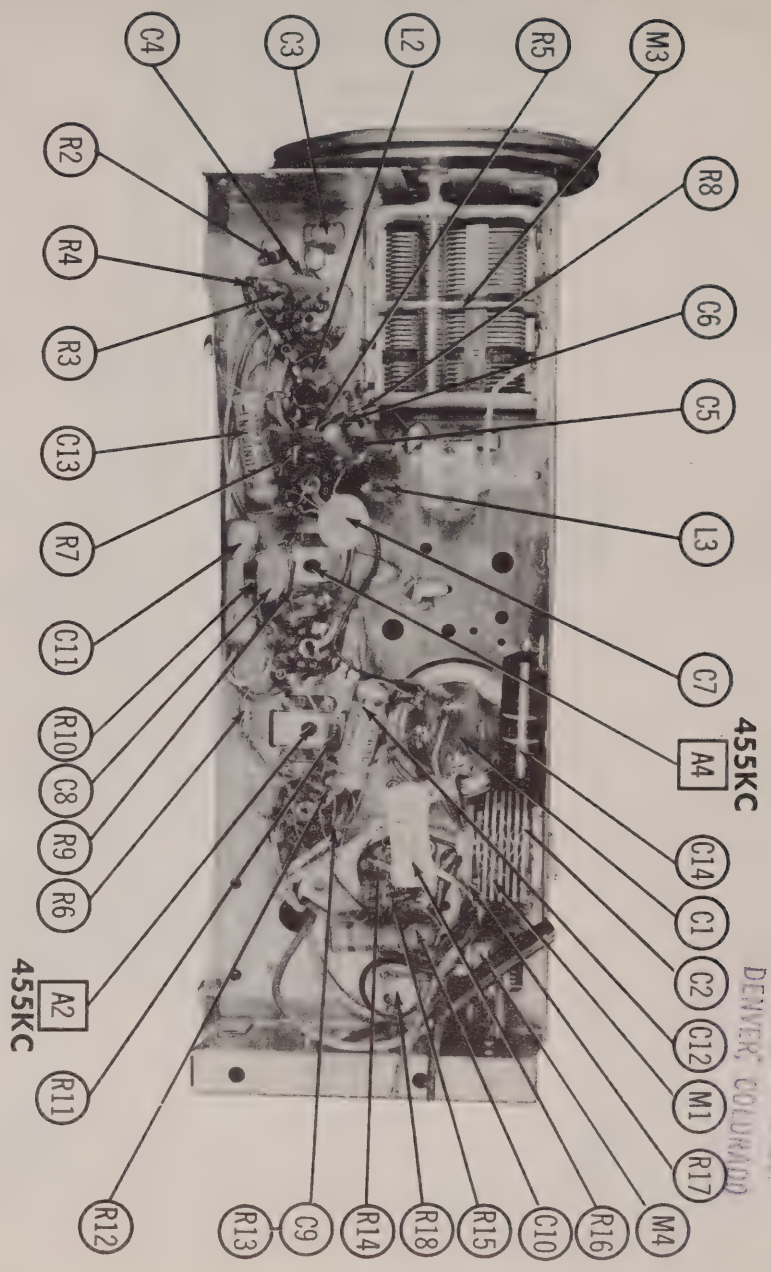
BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	9V "A" 90V "B"				756			T6Z60	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Tuning Capacitor	19C621583	19-405MMF, 19-205MMF, 9-100MMF
M4	Switch	40B611599	Power Selector
	Cabinet	16E621388	Model 63L1
	Cabinet	16K621389	Model 63L2
	Cabinet	16K521390	Model 63L3
	Cover Assy. (Back)	1V630334	Model 63L1
	Cover Assy. (Back)	1V630335	Model 63L2
	Cover Assy. (Back)	1V630336	Model 63L3
	Grille	13R621597	
	Dial Scale	34C621735	
	Dial Glass	61B621611	
	Knob	36B621663	Off/On/Volume, Tuning (Model 63L1) 2 used
	Knob	36K621664	Off/On/Volume, Tuning (Model 63L2) 2 used
	Knob	36K621665	Off/On/Volume, Tuning (Model 63L3) 2 used

CHASSIS—BOTTOM VIEW



PROPERTY
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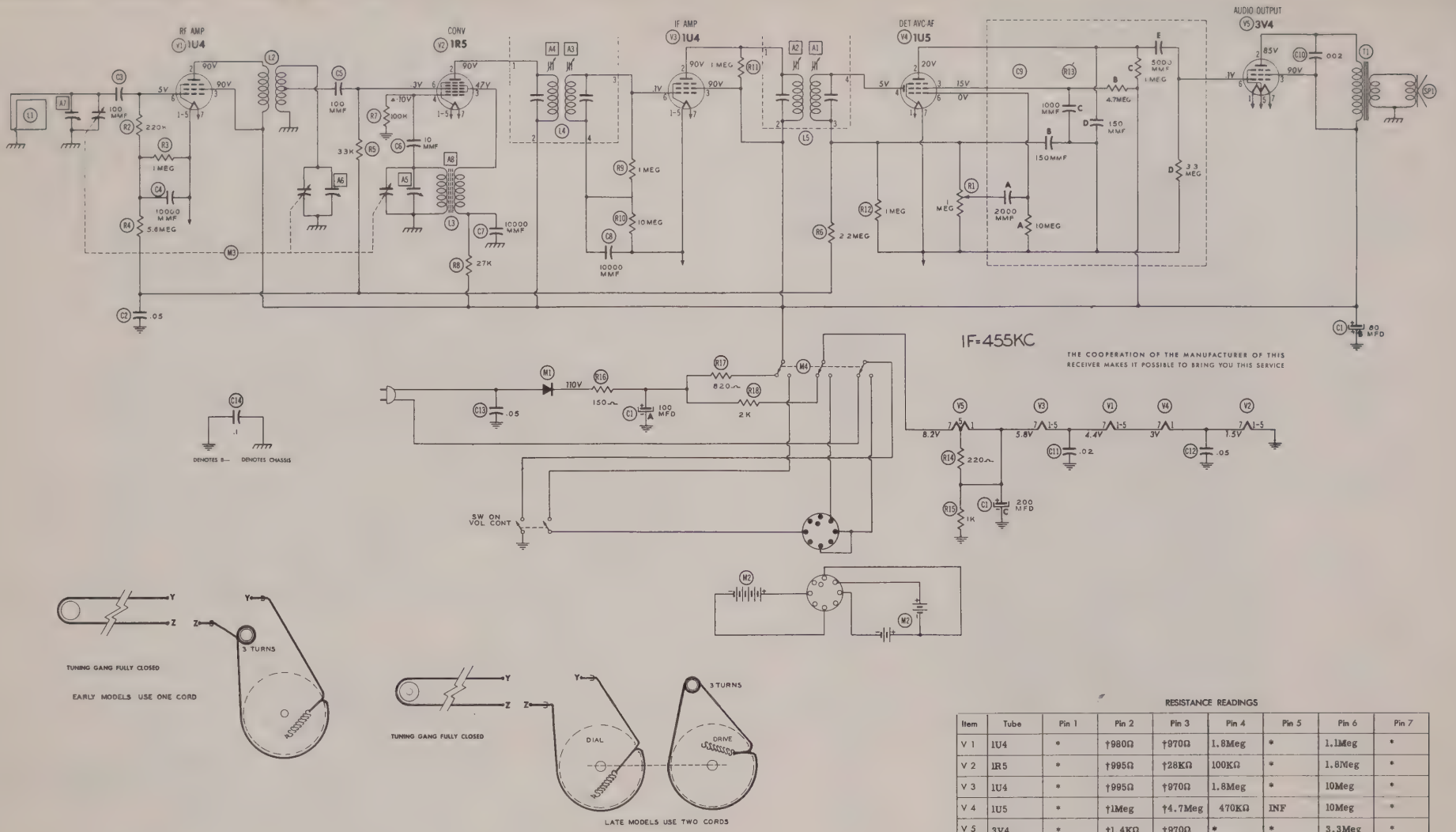
3924 MIAMI ST.
DENVER, COLORADO

MOTOROLA MODEL 63L1

MOTOROLA MODEL 63L1



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1U4	*	†980Ω	†970Ω	1.8Meg	*	1.1Meg	*
V 2	1R5	*	†995Ω	†28KΩ	100KΩ	*	1.8Meg	*
V 3	1U4	*	†995Ω	†970Ω	1.8Meg	*	10Meg	*
V 4	1U5	*	†1Meg	†4.7Meg	470KΩ	INF	10Meg	*
V 5	3V4	*	†1.4KΩ	†970Ω	*	*	3.3Meg	*

▲ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM OUTPUT OF M1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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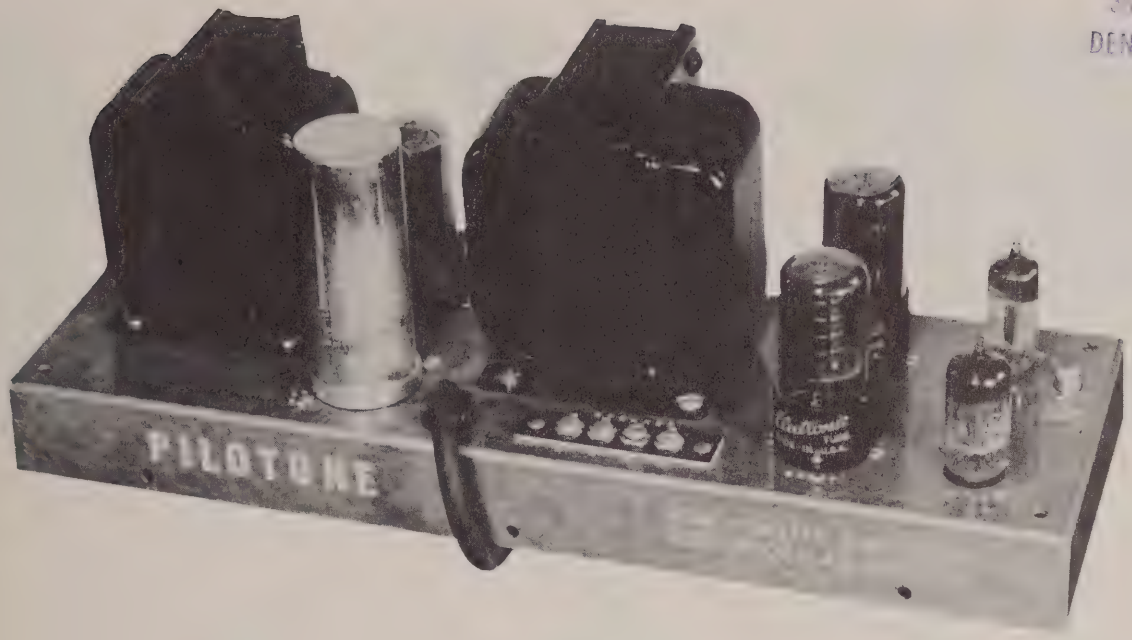
222-8

1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

PILOT
MODEL AA-902

PROPERTY OF
L. F. BLANKENSHIP
3624 MEADE ST
DENVER, COLORADO

PILOT
MODEL AA-902



PILOT
MODEL AA-902

TRADE NAME	Pilot Model AA-902	
MANUFACTURER	Pilot Radio Corp., 37-06 36th. St., Long Island City, N.Y.	
TYPE SET	AC Operated 10 Watt Audio Amplifier	
TUBES (Five)	Types 6C4 AF Amp., 12AU7 AF Amp.-Phase Inv., (2) 6V6GT Audio Output, 5Y3GT Rectifier	
POWER SUPPLY	110-120 Volts AC	RATING .15 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

PILOT
MODEL AA-902

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		PILOT PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	6C4	6C4	6BG	
V2	AF Amplifier-Phase Inverter	12AU7	12AU7	9A	
V3	Audio Ouput	6V6GT	6V6GT	7S	
V4	Audio Output	6V6GT	6V6GT	7S	
V5	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PILOT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲20	450	24-120	AFH3-45		CO36		FP391.1	TVL-3789	
B	■60	450		PRS450/20		BR2045A		TC75	TVA-1709	
C	▲20	450								
D	20	450								
C2	100	50	24-121	PRS50/100		BRH501		TC3501	TVA-1310	
C3	.1	600		P688-1	DF-506	PTE6P1		PT601	6TM-P1	
C4	.047	600		P688-047	D6-502	PTE6S47		PT6147	6TM-S47	
C5	.047	600		P688-047	D6-502	PTE6S47		PT6147	6TM-S47	

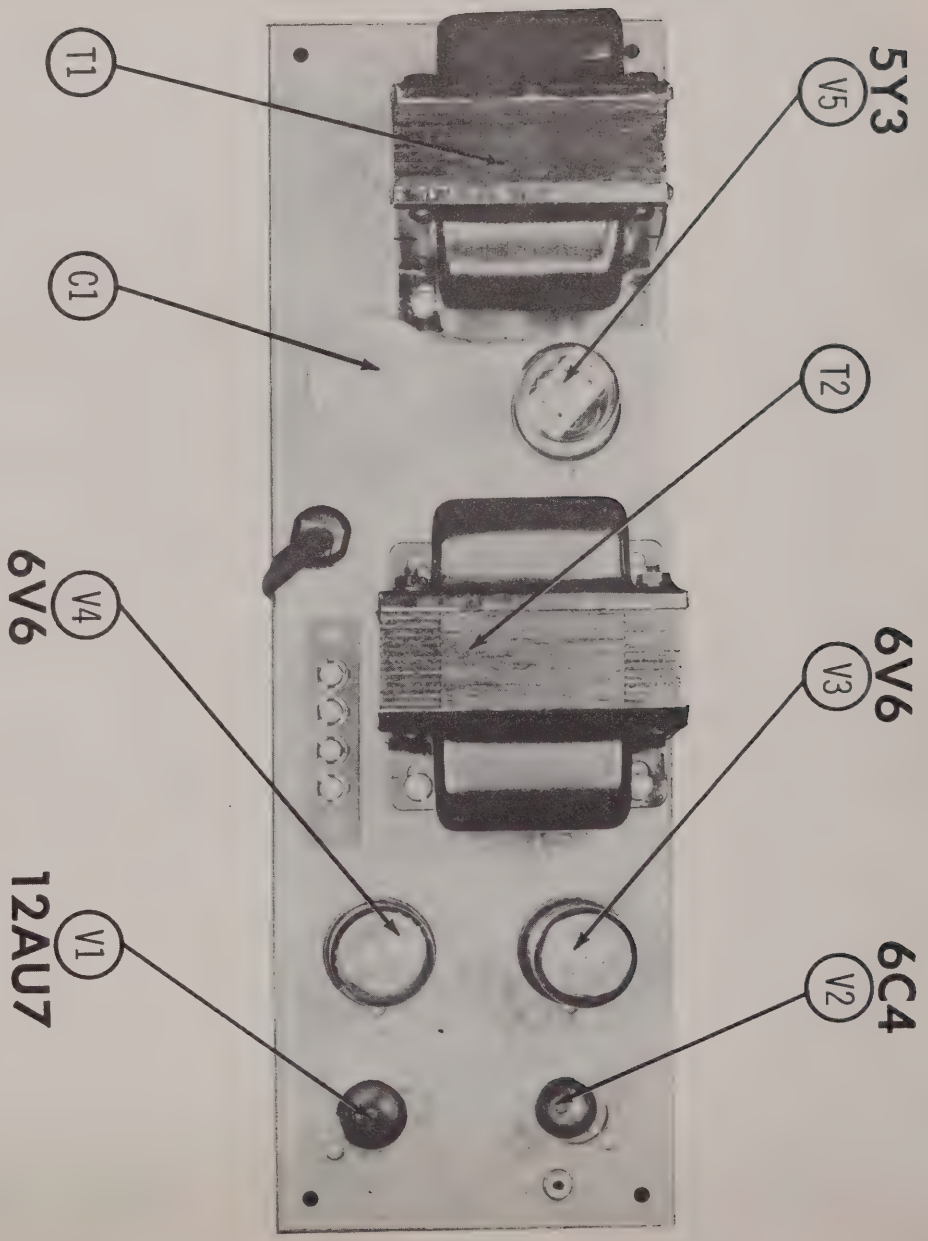
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PILOT PART No.	IRC PART No.	
R1	470KΩ	½		BTS-470K	
R2	6800Ω	½		BTS-6800	
R3	100KΩ	½		BTS-100K	
R4	470KΩ	½		BTS-470K	
R5	10KΩ	½		BTS-10K	
R6	220KΩ	½		BTS-220K	
R7	47KΩ 5%	½			
R8	47KΩ 5%	½			
R9	470KΩ	½		BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PILOT PART No.	IRC PART No.	
R10	300Ω	4		PW4-300	Note
R11	1000Ω	1		BTA-1000	Note
R12	470KΩ	½		BTS-470K	
R13	6800Ω	½		BTS-6800	
R14	10KΩ	½		BTS-10K	
R15	5600Ω	2		BTB-5600	
R16	100Ω	2			
R17	2.2Ω	½			

Note: Some Models may use a single 250Ω (4 Watt) resistor in place of R10 and R11.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

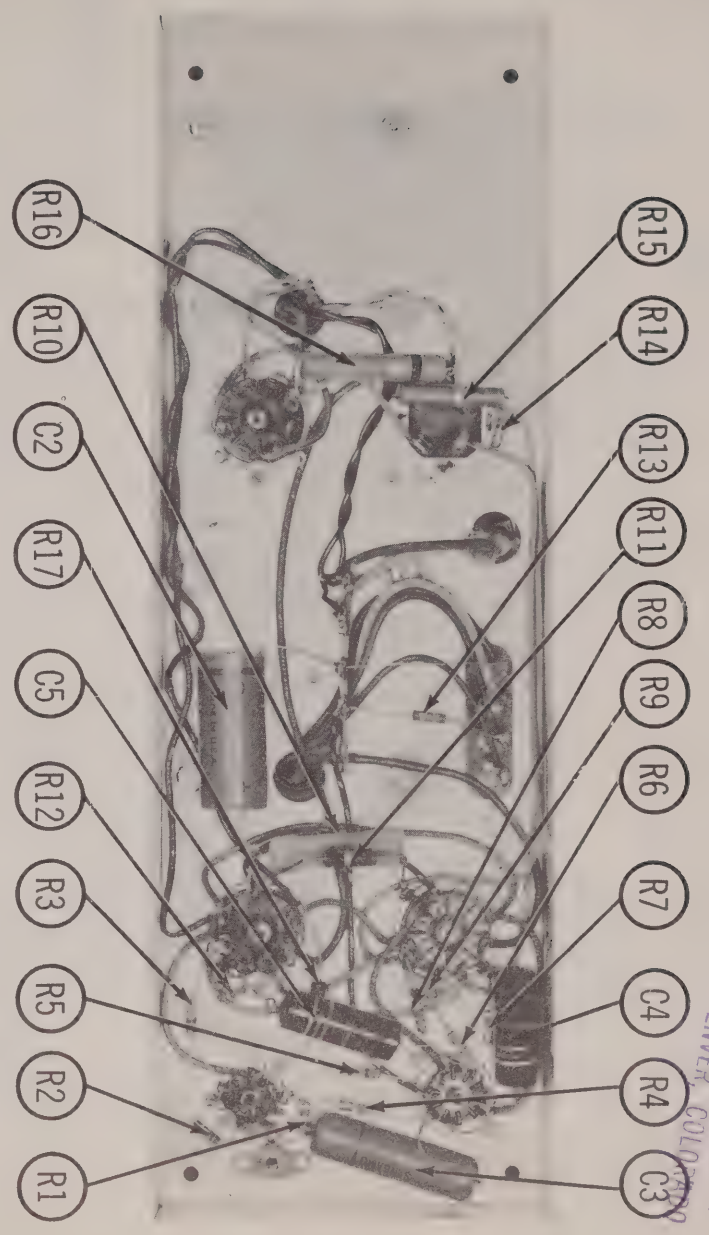
ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	PILOT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @.15A	675VCT .088ADC	5VAC @2A	6.3VCT @1.32A	55-31B	PC-8409 ①	P-3152 ①	PV-90 ①	R-11A ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		PILOT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	10KΩ CT	16Ω tap @8Ω, 4Ω	500Ω CT	.9Ω tap @ .75Ω, .6Ω	53-36		A-3101 ①	PCO-150①	S-31A ①	① Drill new mounting holes.

CHASSIS—BOTTOM VIEW



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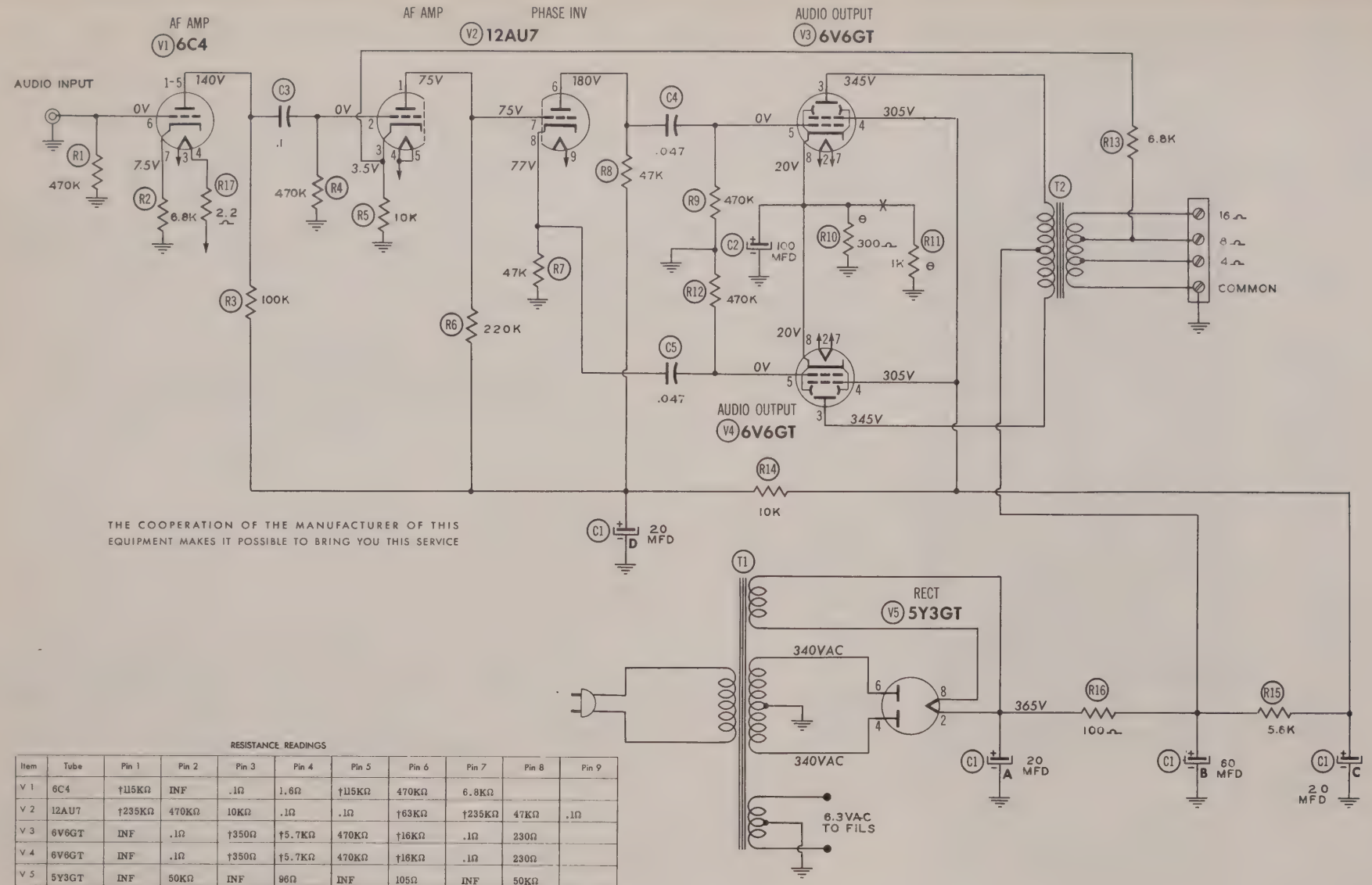
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PILOT
MODEL AA-902

PILOT
MODEL AA-902



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6C4	†115KΩ	INF	.1Ω	1.6Ω	†115KΩ	470KΩ	6.8KΩ		
V 2	12AU7	†235KΩ	470KΩ	10KΩ	.1Ω	.1Ω	†63KΩ	†235KΩ	47KΩ	.1Ω
V 3	6V6GT	INF	.1Ω	†350Ω	†5.7KΩ	470KΩ	†16KΩ	.1Ω	230Ω	
V 4	6V6GT	INF	.1Ω	†350Ω	†5.7KΩ	470KΩ	†16KΩ	.1Ω	230Ω	
V 5	5Y3GT	INF	50KΩ	INF	96Ω	INF	105Ω	INF	50KΩ	

† MEASURED FROM PIN #2 OF V5

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1 - DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

PROPERTY OF
L. F BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PILOT
MODELS AF-723, U

PILOT
MODELS AF-723, U

TRADE NAME	Pilot Models AF-723, AF-723U	
MANUFACTURER	Pilot Radio Corp. , 37-06 36th. St., Long Island City, N.Y.	
TYPE SET	AC Operated AM-FM Superheterodyne Tuner for Custom Installation	
TUBES (Eight)	Types 6BA6 FM-AM RF Amp., 6U8 Conv., 6AB4 AFC, 6BA6 AM FM IF Amp., 6AU6 FM IF Amp., -AM Det., 6AL5 FM Det., 12AU7 Cathode Follower, 6X5GT Rectifier	
POWER SUPPLY	110-120 Volts AC	RATING .30 Amp. @117 Volts AC
TUNING RANGE - BROADCAST	540-1700KC	FREQ. MOD. 88-108MC

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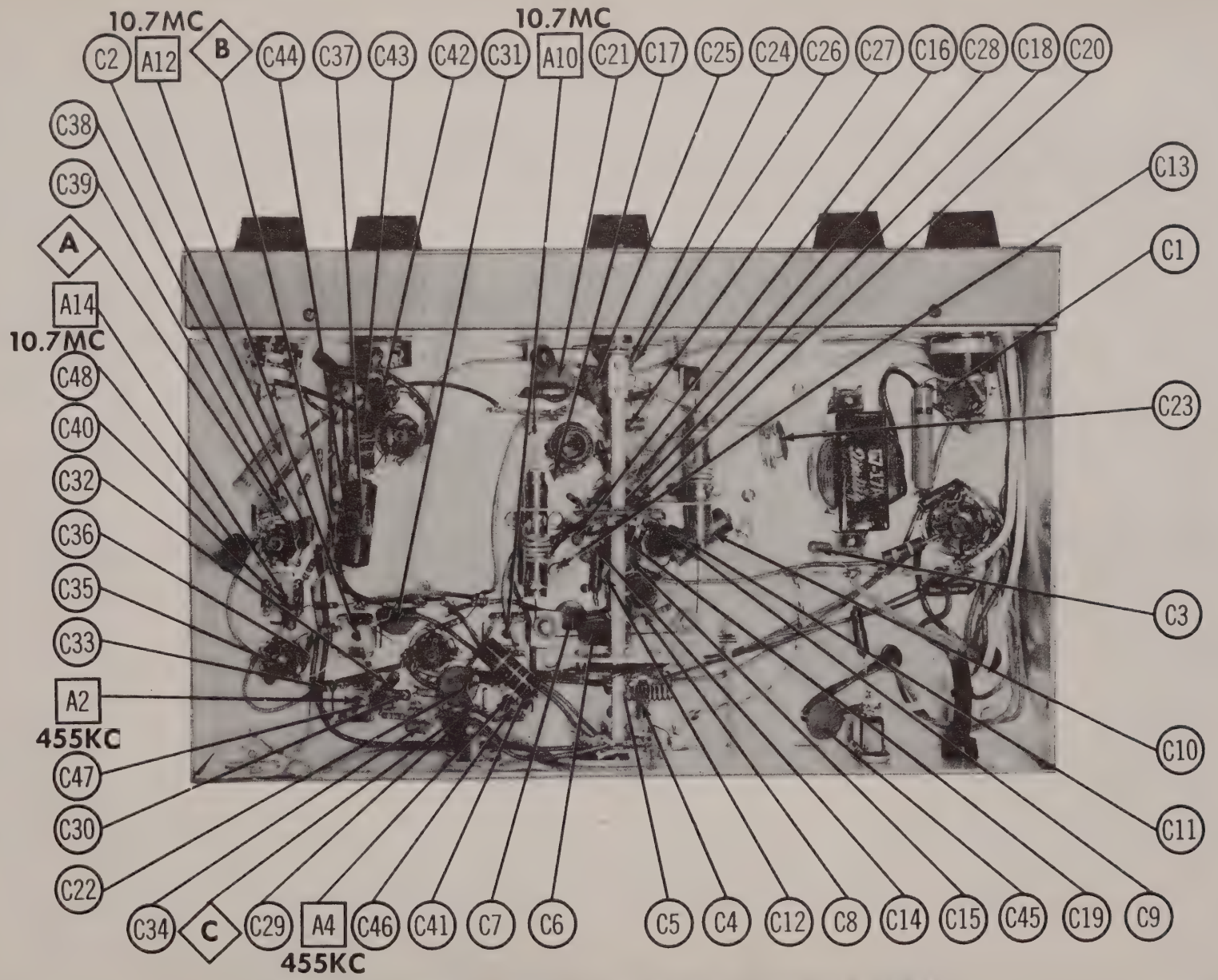
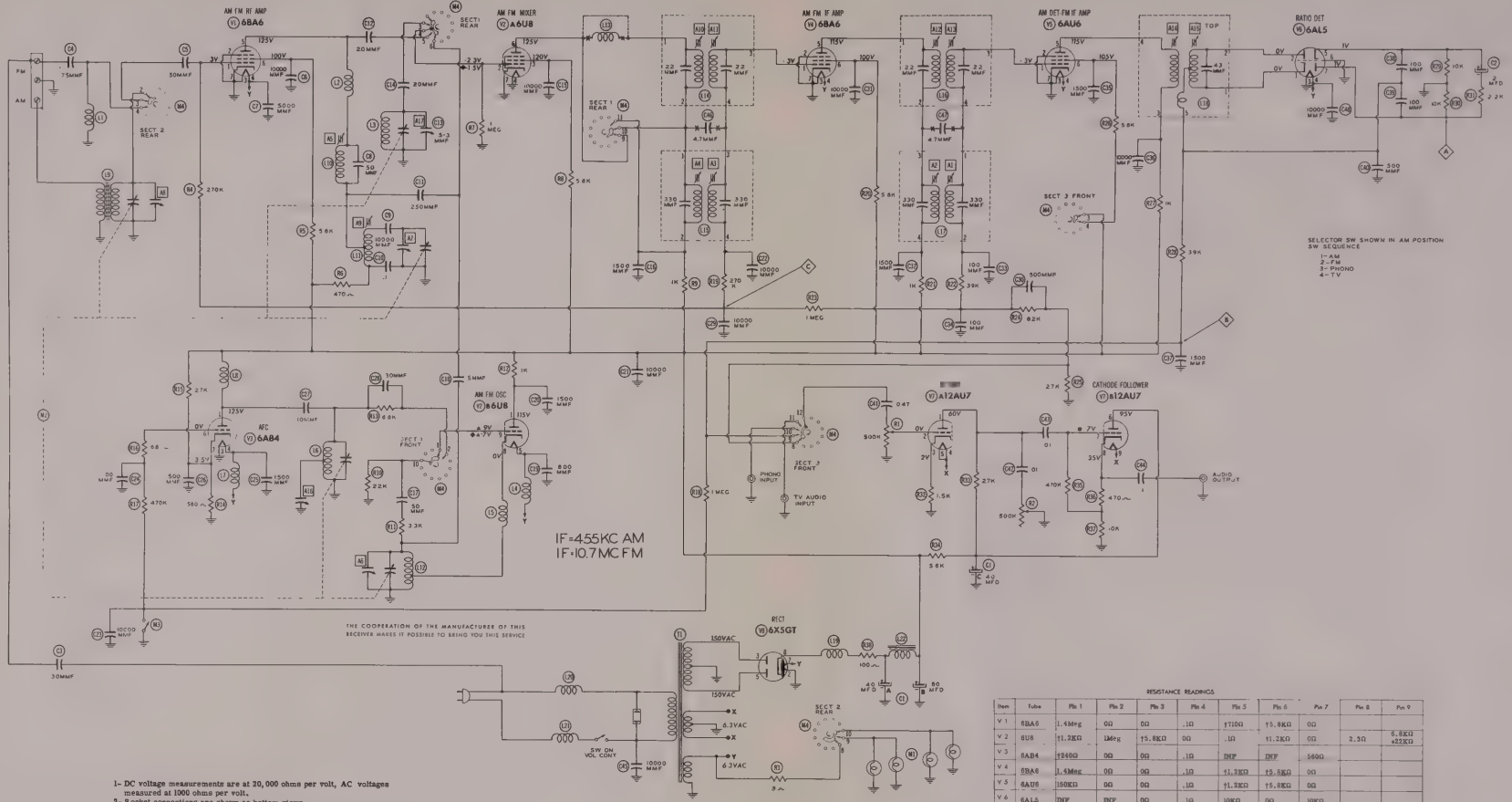


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BA6	1.4Meg	0Ω	0Ω	.1Ω	†710Ω	†5.8KΩ	0Ω		
V 2	6U8	†1.2KΩ	1Meg	†5.8KΩ	0Ω	.1Ω	†1.2KΩ	0Ω	2.3Ω	6.8KΩ ±22KΩ
V 3	6AB4	†240Ω	0Ω	0Ω	.1Ω	INF	INF	560Ω		
V 4	6BA6	1.4Meg	0Ω	0Ω	.1Ω	†1.2KΩ	†5.8KΩ	0Ω		
V 5	6AU6	150KΩ	0Ω	0Ω	.1Ω	†1.2KΩ	†5.8KΩ	0Ω		
V 6	6AL5	INF	INF	0Ω	.1Ω	10KΩ	0Ω	10KΩ		
V 7	12AU7	†28KΩ	80Ω	1.5KΩ	.3Ω	.3Ω	†5.8KΩ	480KΩ	10.5KΩ	.3Ω
V 8	6X5GT	†0Ω	0Ω	92Ω	INF	98Ω	INF	.1Ω	28KΩ	

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE SPECIFIED ("AFC" ON)
* MEASURED IN "AM" POSITION
# MEASURED FROM PIN 8 OF V7
^ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 8 OF V8.

1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- 8 socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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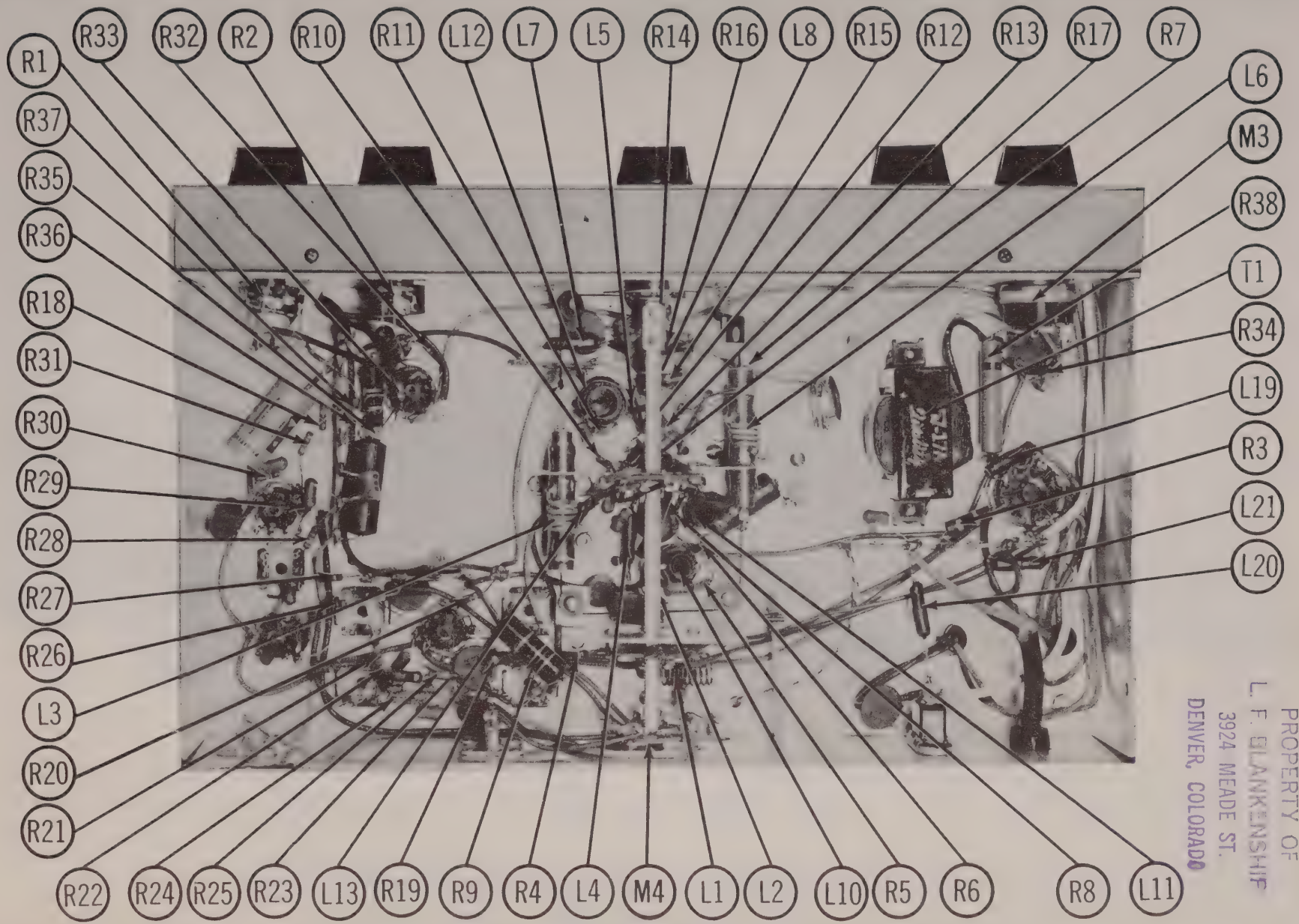
222-10



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PILOT
MODEL AF-723

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Allow tuner warm-up period of 30 minutes before making any adjustments. Before aligning check to see if the FM oscillator capacitor (across L6) and FM RF capacitor (across L3) are fully engaged when the tuning gang is fully closed. If necessary, these capacitors may be set to their proper position by the dial cord adjustment screw. To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to AM antenna terminals. Low side to chassis.	455KC (400~Mod.)	AM	Tuning gang fully closed	DC probe to point (C). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	200MMF	High side thru 200 MMF to AM antenna terminal. Low side to chassis.	"	"	"	"	A5	Adjust for MINIMUM deflection.
3.	"	"	1500KC	"	1500KC	"	A6, A7, A8	Adjust for maximum deflection while rocking gang.
4.	"	"	600KC	"	600KC	"	A9	"
5.	Repeat steps 3 and 4, if necessary.							

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to FM antenna terminal. Low side to chassis.	10.7MC	FM	88	DC probe to point (A). Common to chassis.	A10, A11, A12, A13, A14	Adjust for maximum deflection.
7.	"	"	"	"	"	DC probe to point (B). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
6	.01MFD	High side to FM antenna terminals. Low side to chassis.	10.7MC (450KC Swp)	FM	88	High side to point (A). Low side to chassis.	A10, A11 A12, A13 A14	Disconnect stabilizing capacitor C2. Adjust for maximum amplitude and symmetry with 10.7MC occuring at center of response curve. See fig. 1
7	"	"	"	"	"	High side to point (C). Low side to chassis.	A15	Reconnect stabilizing capacetor C2. Adjust so that 10.7MC falls at the center of the crossover lines as in fig. 2. Retouch A14 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

Switch AFC to "Off" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	270Ω Carbon Resistor	High side to FM antenna terminal. Low side to chassis.	90MC	FM	90	DC probe to point (B). Low side to chassis.	L6, L3	Adjust by compressing or expanding coil turns. Adjust for maximum deflection while rocking tuning gang.
9.	"	"	106MC	"	106	"	A16, A17	Adjust for maximum deflection while rocking tuning gang.
10.	"	"	98MC	"	98	"	L1	Adjust by compressing or expanding coil turns. Adjust for maximum deflection while rocking tuning gang.
11.	Repeat steps 8, 9 and 10, if necessary.							

FIG. 1

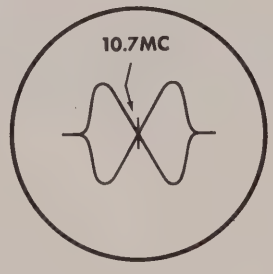


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		PILOT PART No.	STANDARD REPLACEMENT		
V1	FM AM RF Amp.	6BA6	6BA6	7BK	
V2	Converter	6U8	6U8	9AE	
V3	AFC	6AB4	6AB4	5CE	
V4	FM AM IF Amp.	6BA6	6BA6	7BK	
V5	FM IF Amp.-AM Detector	6AU6	6AU6	7BK	
V6	Ratio Detector	6AL5	6AL5	6BT	
V7	AF Amplifier-Cathode Follower	12AU7	12AU7	9A	
V8	Rectifier	6X5GT	6X5GT	6S	

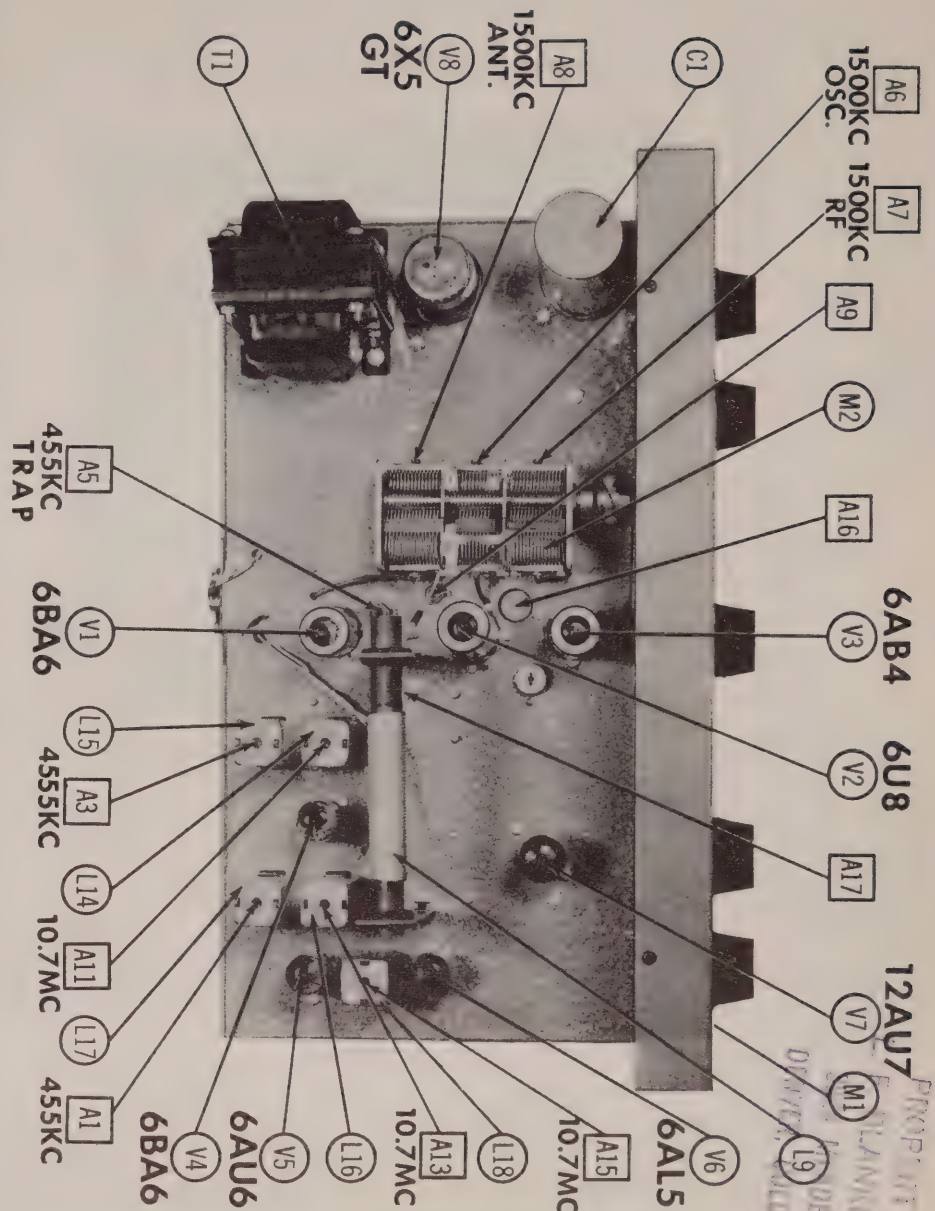
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PILOT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▬40	250		AFH3-44		BO48		FP422.7	TVL-2582	
B	■80	250		PRS250/40		BR4025A			TVA-4511	
C	▲40	250								
C2	2	50		PRS150/4		BBR2-50T		TC302	TVA-1301	
C3	30			SI30			GP1K-300		5GA-Q3	
C4	7.5								5GA-V75	
C5	50			SI50	D6-500	TM5Q5	GP1K-500	UC-545	5GA-Q5	
C6	10000			BPD-01	MD-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C7	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C8	50			SI50NP0	TCZ-50		NP0-333-500	ZT-545	5TCC-Q5	
C9	10000			BPD-01	MD-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C10	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C11	250			SI250	D6-251		GP2K-251	UC-5325	5GA-T25	
C12	20			SI20	D6-200		GP1K-200		5GA-Q2	
C13	.5-3				829-3			CT-565		
C14	20			SI20	D6-200		GP1K-200		5GA-Q2	
C15	10000			BPD-01	MD-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C16	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C17	50			SI50	D6-500	TM5Q5	GP1K-500	UC-545	5GA-Q5	
C18	5			SI5N750	TCN-5		N750K-050	NT-555		
C19	800			BPD-008	DD-801	TM5D1	801-001	DC-521	5HK-D1	
C20	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C21	10000			BPD-01	MD-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C22	10000			BPD-01	MD-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C23	10000			BPD-01	MD-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C24	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C25	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5GA-D15	
C26	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C27	10									
C28	30									
C29	10000			BPD-01	MD-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C30	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C31	10000			BPD-01	MD-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C32	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C33	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C34	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C35	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C36	10000			BPD-01	MD-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C37	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C38	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C39	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C40	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C41	.047	400		P488-047		PTE4S47		PT4147	4TM-S47	
C42	.01	400		P488-01	DD-1032	PTE4S1	GP2-333-103	PT411	4TM-S1	
C43	.01	400		P488-01	DD-1032	PTE4S1	GP2-333-103	PT411	4TM-S1	
C44	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C45	10000			BPD-01	MD-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C46	4.7			SI4.7NP0	TCZ-4.7		NP0K-4R7	ZT-555	5TCCB-V47	Note 1
C47	4.7			SI4.7NP0	TCZ-4.7		NP0K-4R7	ZT-555	5TCCB-V47	Note 1
C48	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	Note 1

Note 1. Not used in all Models.

CHASSIS—TOP VIEW



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PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PILOT PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	36-44	Q13-133	AG-60-Z	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	500KΩ	½	37-23A	Q13-133	AG-60-Z	B-60	U-48	Tone
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PILOT PART No.	IRC PART No.	
R3	3Ω	1			
R4	270KΩ	½		BTS-270K	
R5	5600Ω	½		BTS-5600	
R6	470Ω	½		BTS-470	
R7	1Meg	½		BTS-1Meg	
R8	5600Ω	½		BTS-5600	
R9	1000Ω	½		BTS-1000	
R10	22KΩ	½		BTS-22K	
R11	3300Ω	½		BTS-3300	
R12	1000Ω	½		BTS-1000	
R13	6800Ω	½		BTS-6800	
R14	560Ω	½		BTS-560	
R15	27KΩ	1		BTA-27K	
R16	68Ω	½			
R17	470KΩ	½		BTS-470K	
R18	1Meg	½		BTS-1Meg	
R19	270KΩ	½		BTS-270K	
R20	5600Ω	½		BTS-5600	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PILOT PART No.	IRC PART No.	
R21	1000Ω	½		BTS-1000	
R22	39KΩ	½		BTS-39K	
R23	1Meg	½		BTS-1Meg	
R24	82KΩ	½		BTS-82K	
R25	27KΩ	½		BTS-27K	
R26	5600Ω	½		BTS-5600	
R27	1000Ω	½		BTS-1000	
R28	39KΩ	½		BTS-39K	
R29	10KΩ	½		BTS-10K	
R30	10KΩ	½		BTS-10K	
R31	2200Ω	½		BTS-2200	
R32	1500Ω	½		BTS-1500	
R33	27KΩ	½		BTS-27K	Note
R34	5600Ω	½		BTS-5600	
R35	470KΩ	½		BTS-470K	
R36	470Ω	½		BTS-470	
R37	10KΩ	½		BTS-10K	
R38	100Ω	2			

Note : Some Models may use a 22KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	PILOT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @.30A	300VCT .059A	6.3VCT @.30A	6.3VAC @3A	55-30				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	PILOT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω		70-78				
L2	RF Choke	1.1Ω		75-33			4610	6 Microhenries
L3	FM RF Coil Assembly	0Ω		271-34				
L4	Fil. Choke	0Ω		75-19	19-3001	TV-189	6175	.9 Microhenry
L5	Cathode Choke	1.1Ω		75-33			4610	6 Microhenries
L6	FM Osc. Coil Assembly	0Ω		272-56				
L7	Fil. Choke	0Ω		75-19	19-3001	TV-189	6175	.9 Microhenry
L8	RF Choke	1.1Ω		75-33			4610	6 Microhenries
L9	AM Ant. Coil	0Ω	.1Ω	270-52				
L10	IF Trap	25Ω		79-102				
L11	AM RF Coil	6.5Ω		71-38				Tapped @ 3.3Ω
L12	AM Osc. Coil	2.4Ω		72-73			71-Osc.	Tapped @1.2Ω
L13	RF Choke	0Ω		75-19	19-3001	TV-189	6175	.9 Microhenry, Not used in all Models.
L14	1st. FM IF	.7Ω	.7Ω	1607-6	16-3487	FM-254	1463	
L15	1st. AM IF	9Ω	9Ω	273-129	16-6758	BC-352	12-C1	
L16	2nd. FM IF	.7Ω	.7Ω	1607-6	16-3487	FM-254	1463	
L17	2nd. AM IF	9Ω	9Ω	273-129	16-6758	BC-253	12-C2	
L18	Ratio Det.	1.6Ω	.9ΩCT	279-72		FM-255	1465	Tertiary winding-.4Ω
L19	RF Choke	0Ω		75-19	19-3001	TV-189	6175	.9 Microhenry
L20	RF Line Choke	0Ω		75-19	19-3001	TV-189	6175	.9 Microhenry
L21	RF Line Choke	0Ω		75-19	19-3001	TV-189	6175	.9 Microhenry

PARTS LIST AND DESCRIPTIONS (Continued)

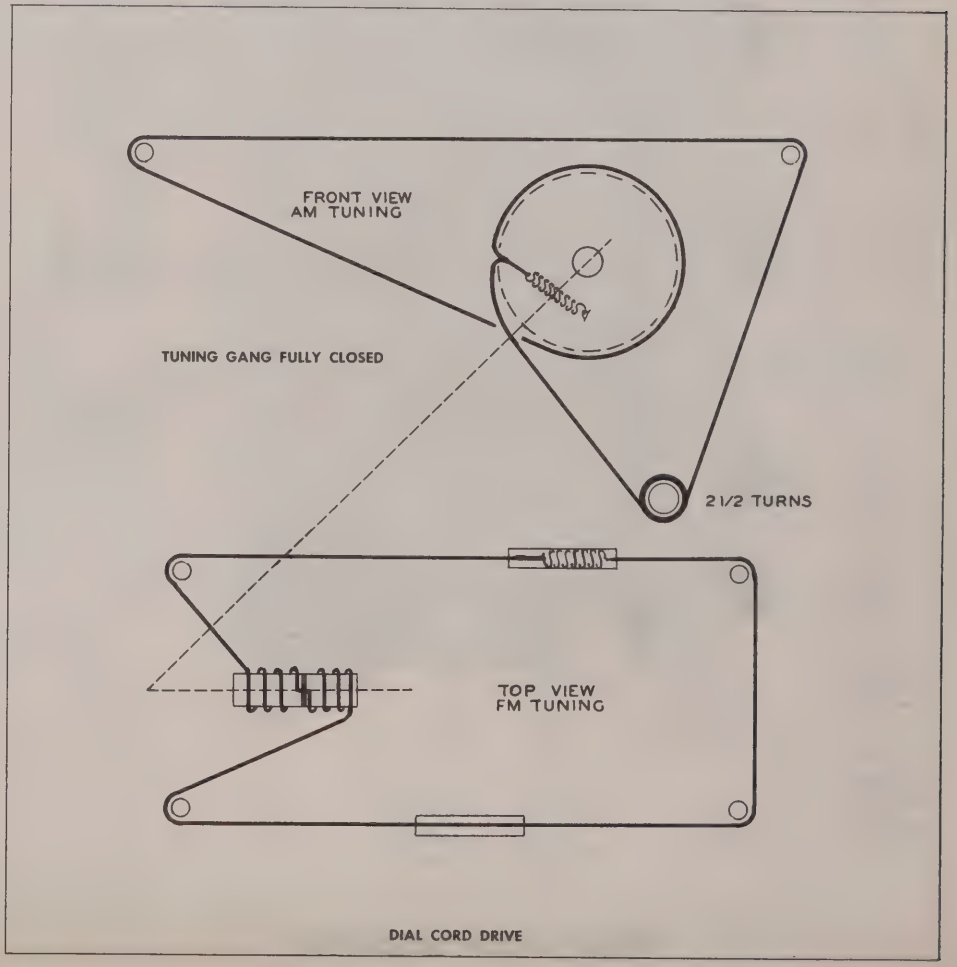
FILTER CHOKE

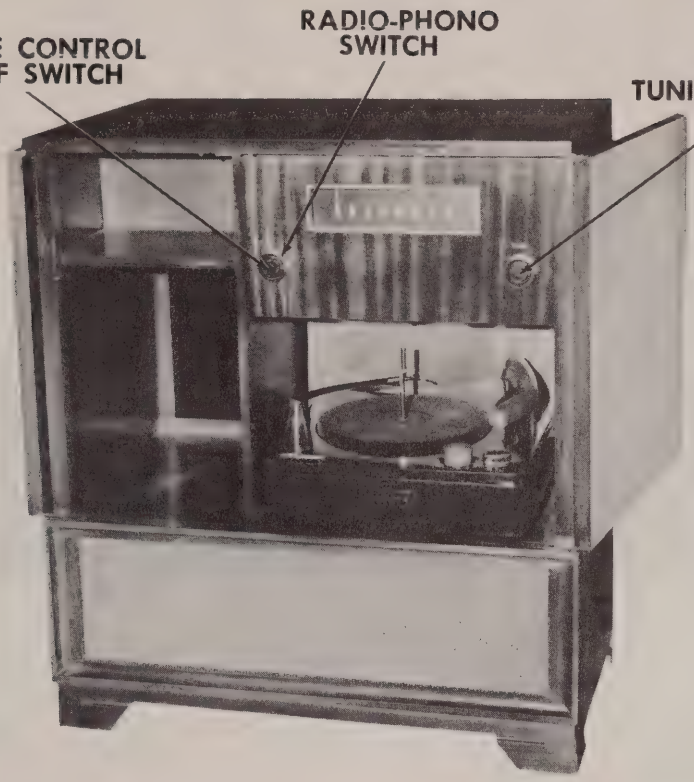
ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	PILOT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L22	.059ADC	140Ω	2.6Hy.	57-17	C-2303 ①			

① Drill one new mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	PILOT PART No.	NOTES
M1	Dial Light	68-6	4 Used
M2	Tuning Capacitor	26-56	30-482MMF, 30-482MMF, 13-155MMF
M3	Switch	100-77	AFC Off/On
M4	Switch	100-80	Function Selector





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DENVER, COLORADO

RCA VICTOR
MODEL 2-S-7 (Ch. RC1117D)

RCA VICTOR
MODEL 2-S-7 (Ch. RC1117D)

TRADE NAME	RCA Victor Model 2-S-7 (Ch. RC1117D)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, N.J.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne Receiver
TUBES (Six)	Types 12BE6 Conv., 12BA6 IF Amp., 6AQ6 Det.-AVC-AF Amp., 6AQ6 Phase Inv. (2) 35C5 Audio Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .30 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side thru .1MFD to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400%Mod)	Quiet point near 1600KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	Tuning gang fully open	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	1400KC	"	A6	"
4.		"	600KC	Tune to 600KC signal	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Adjust for maximum output while rocking tuning gang.
5.	Repeat steps 2, 3 and 4 if necessary.						

To set dial pointer form tuning gang fully closed. Adjust pointer to the last reference mark on the left hand edge of dial back plate (3 15/16" from left hand edge).

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT 930409, SEE SIMILAR V-M MODEL 950- PHOTOFACT SET 107, FOLDER 13 OR RECORD CHANGER MANUAL CM-3.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp	6AQ6	6AQ6	7BT	
V4	Phase Inverter	6AQ6	6AQ6	7BT	
V5	Audio Output	35C5	35C5	7CV	
V6	Audio Output	35C5	35C5	7CV	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■80	150	73013	AFH3-13		CO12		FP216	R1312	
B	▲30	150						TC42		
C	10	150								
C2	.047	400	73553	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C3	56		77116							
C4	.0018	600	73851		D6-182		GP2-333-182			
C5	.0022	600	73595	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C6	.0018	600	73851		D6-182		GP2-333-182			Note
C7	56		93603	SI56	D6-560		GP1K-560	UC-5456		
C8	.0047	400	73920	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C9	.022	200	73562	P488-022		PTE4S22		PT4122	4TM-S22	
C10	.0033	400	73795	P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233		
C11	120		76347	SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C12	.0056	400	73788		D6-562		GP2-333-562			
C13	.022	200	73562	P488-022		PTE4S22		PT6222	4TM-S22	
C14	.012	200	73561	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C15	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C16	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C17	.047	400	73553	P488-047		PTE4S47		PT4147	4TM-S47	
C18	.047	400	75071	P488-047		PTE4S47		PT4147	4TM-S47	
C19	.047	400	73553	489ZX-047		PJ4147		PT4147	4TM-S47	

Note: Some Models use .01 Ⓐ 600V in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	76874	Q13-139X	AT-115	ABT-79	UT-454	Volume-Tapped Ⓐ 400KΩ
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RCA Victor PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	39KΩ	½	503339	BTS-39K	
R3	330KΩ	½	503433	BTS-330K	
R4	47KΩ	½	503347	BTS-47K	
R5	3.3Meg	½	503533	BTS-3.3Meg	
R6	120KΩ	½	503412	BTS-120K	
R7	390KΩ	½	503439	BTS-390K	
R8	270Ω	½	503127	BTS-270	
R9	1.5Meg	½	503515	BTS-1.5Meg	
R10	56KΩ	½	503356	BTS-56K	
R11	10Meg	½	503610	BTS-10Meg	
R12	220KΩ	½	503422	BTS-220K	
R13	10Meg	½	503610	BTS-10Meg	

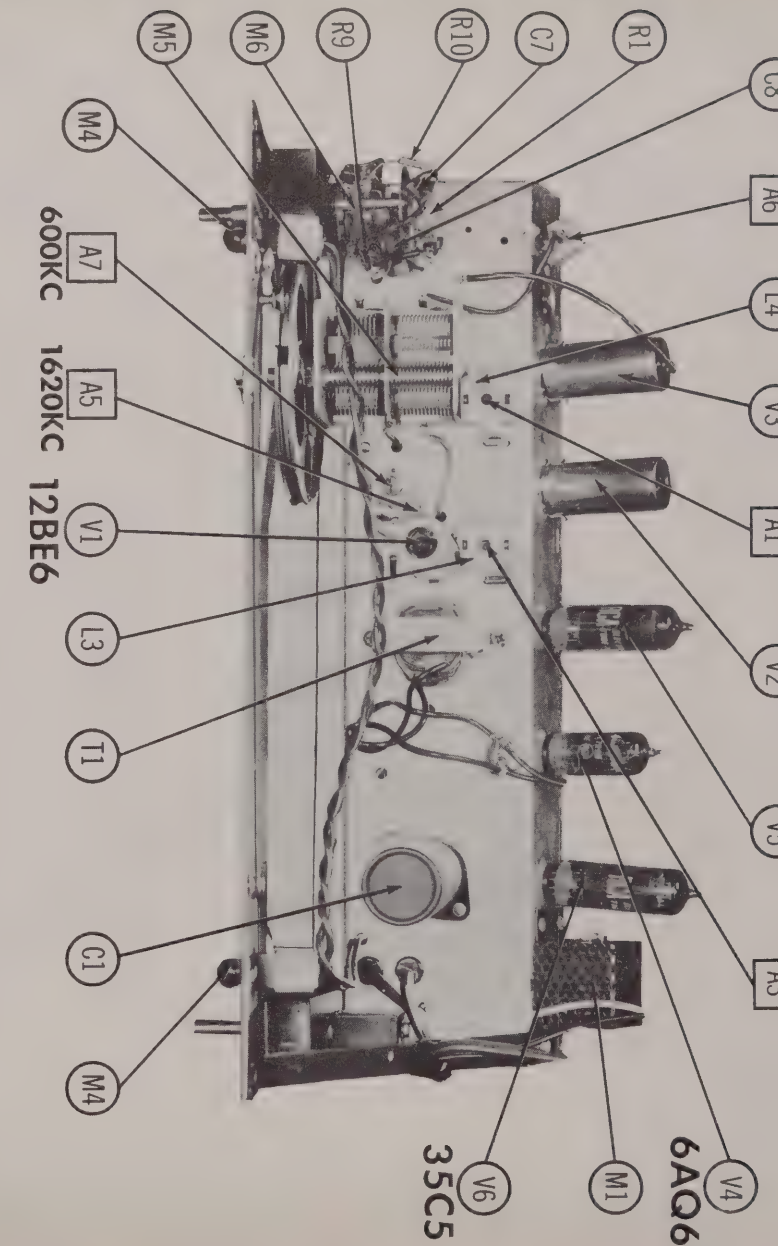
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RCA Victor PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R14	220KΩ	½	503422	BTS-220K	
R15	470KΩ	½	503447	BTS-470K	
R16	12KΩ	½	503312	BTS-12K	
R17	82Ω	½	503082	BTS-82	
R18	470KΩ	½	503447	BTS-470K	
R19	1800Ω	½	503218	BTS-1800	
R20	1200Ω	1	513212	BTA-1200	
R21	66Ω	5	77379		
R22	*	*	73072		
R23	220KΩ	½	503422	BTS-220K	

* 95Ω at 38°C and 13.5Ω at 104° C.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: RCA Victor PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	4.6KΩ CT	4Ω	282Ω CT	.56Ω	77122	A-3856	A-2900	RO-301	S-51X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	JENSEN PART No.	QUAM PART No.	
SP1	8"	PM	4Ω	74664	ST-115 Mod. P8-V	8A21	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	1.4Ω		76876				Includes cabinet back
L2	Osc. Coil	.4Ω	5.5Ω	76866		BC-381	71-Osc.	
L3	Input IF	12Ω	12Ω	74918	16-6758	BC-352	12-C1	
L4	Output IF	16Ω	16Ω	73037	16-6770	BC-355	12-C6	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	RCA Victor PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.085ADC	76871		5M1	1101	6S100A	100A

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA						REMARKS
	RCA Victor PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	75475	*9-D	Q or Q-33			96-0	0-1 or 0-3	* Complete arm & cartridge assembly

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

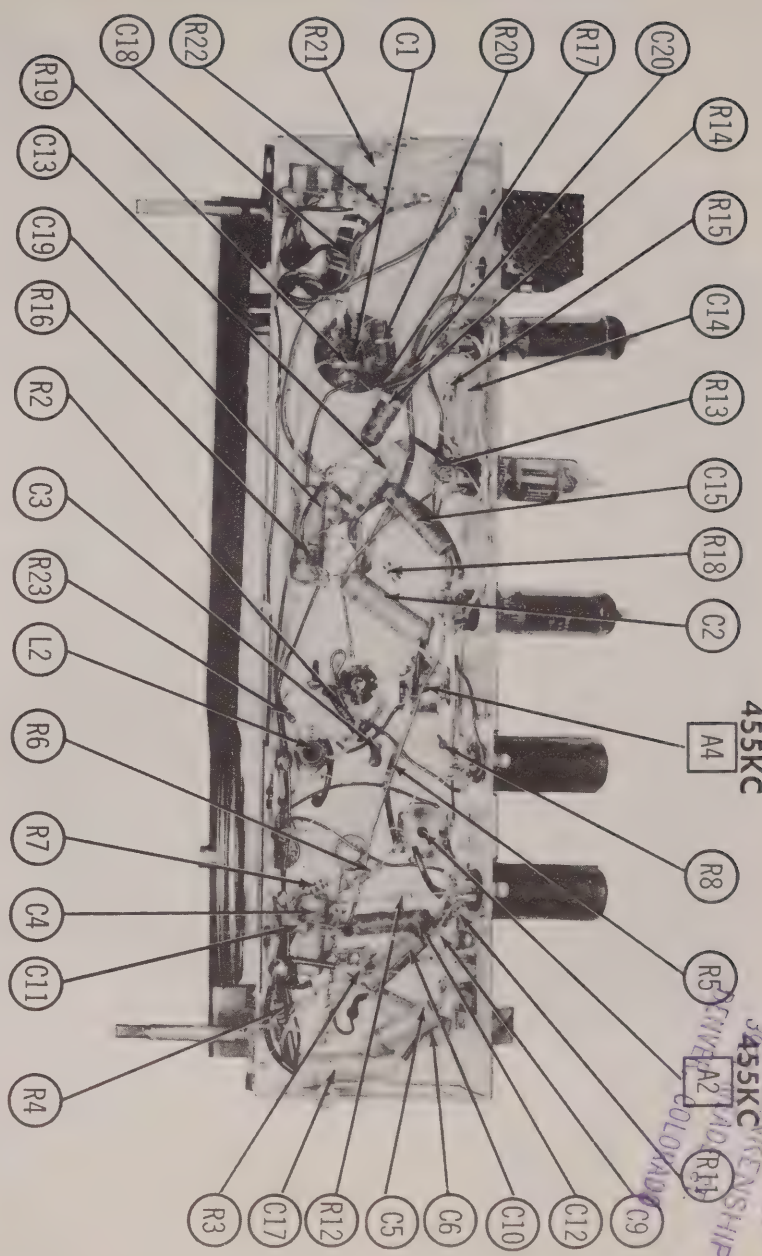
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	RCA Victor PART No.	WALCO PART No.	JENSEN PART No.	
M3		W-44A or W-44S & W-44MGA or W-44MGS	M-74 or M-75 & M-74LP or M-75LP	

MISCELLANEOUS

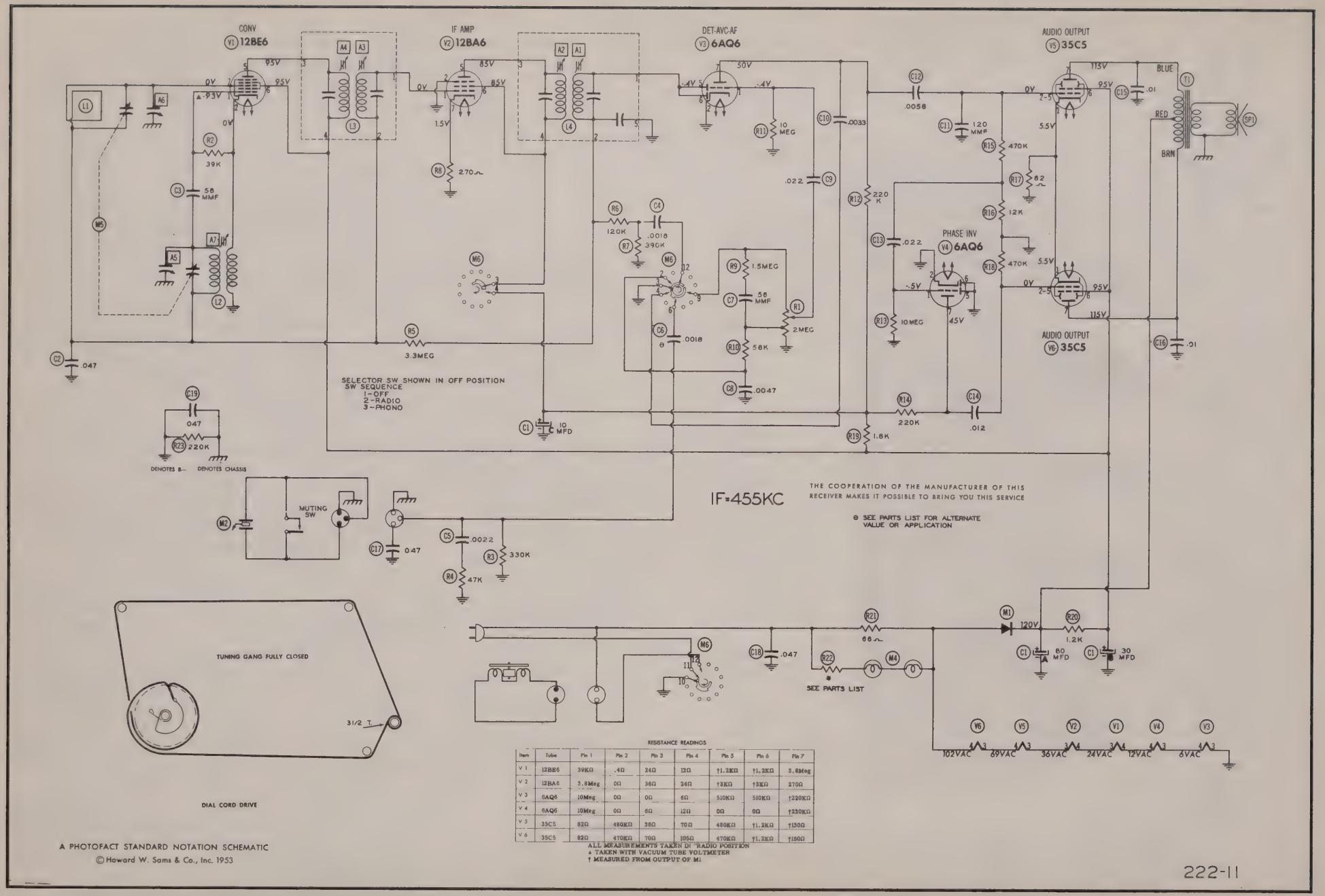
ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M4	Dial Light	11765	Type #51 (2 used)
M5	Tuning Cap.	76867	9-440MMF, 17-180MMF
M6	Switch	76873	Function Selector
A5	Trimmer Cap.	76872	Oscillator Adj. (2.5-30MMF)
A6	Trimmer Cap.	76872	Antenna Adj. (2.5-30MMF)
	Dial Glass	77889	
	Escutcheon	74205	
	Pointer	77378	
	Knob	77871	Function Selector, Mahogany or walnut instruments
	Knob	77872	Function Selector, Blonde Mahogany Instruments
	Knob	77385	Tuning (outer), Mahogany or walnut instruments
	Knob	75945	Tuning (inner), Mahogany or walnut instruments
	Knob	77386	Tuning (outer), Blonde Mahogany instruments
	Knob	77382	Tuning (inner), Blonde Mahogany instruments
	Knob	74963	Volume, Mahogany or walnut instruments
	Knob	75464	Volume, Blonde mahogany instruments

CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP
3455 KIPLING
DENVER, COLORADO

RCA VICTOR
MODEL 2-S-7 (Ch. RCU17D)



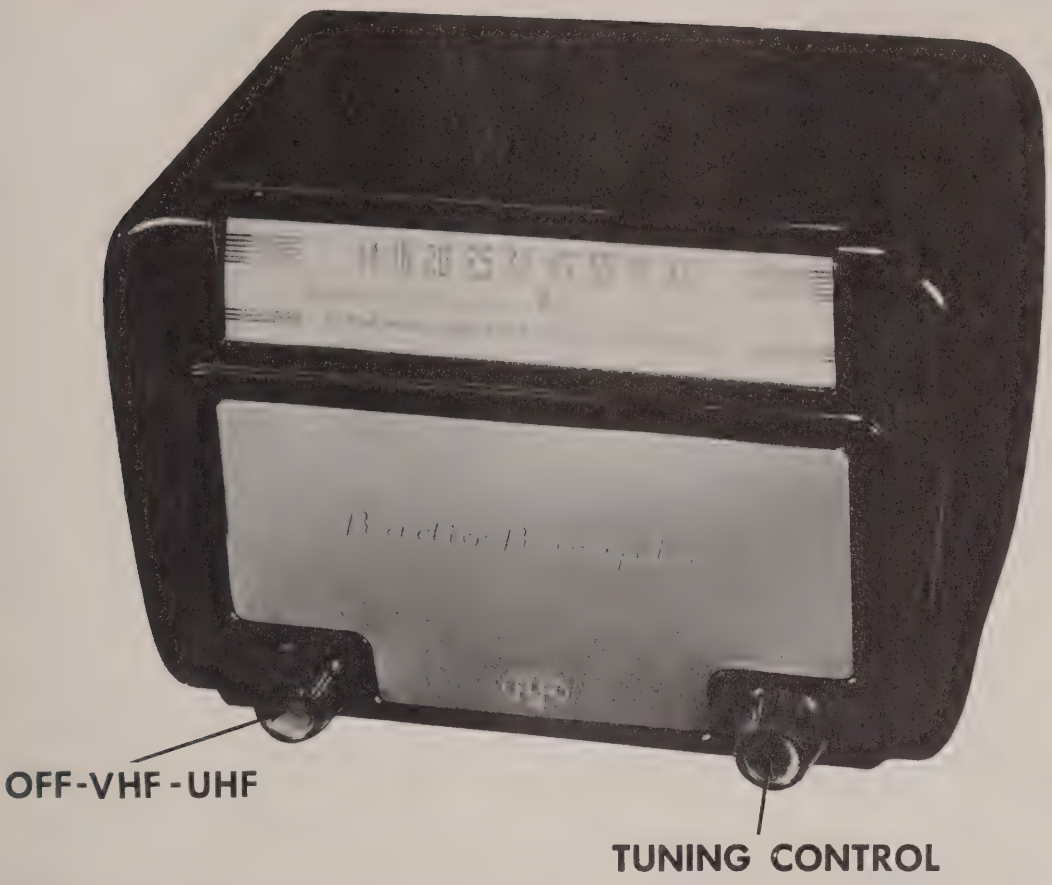
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	39KΩ	.4Ω	24Ω	12Ω	†1.2KΩ	†1.2KΩ	3.8Meg
V 2	12BA6	3.8Meg	0Ω	36Ω	24Ω	†3KΩ	†3KΩ	270Ω
V 3	6AQ6	10Meg	0Ω	0Ω	6Ω	510KΩ	510KΩ	†220KΩ
V 4	6AQ6	10Meg	0Ω	6Ω	12Ω	0Ω	0Ω	†220KΩ
V 5	35C5	82Ω	480KΩ	38Ω	70Ω	480KΩ	†1.2KΩ	†130Ω
V 6	35C5	82Ω	470KΩ	70Ω	105Ω	470KΩ	†1.2KΩ	†150Ω

1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

RADIO RECEPTOR
MODEL C-1709-P UHF Conv.

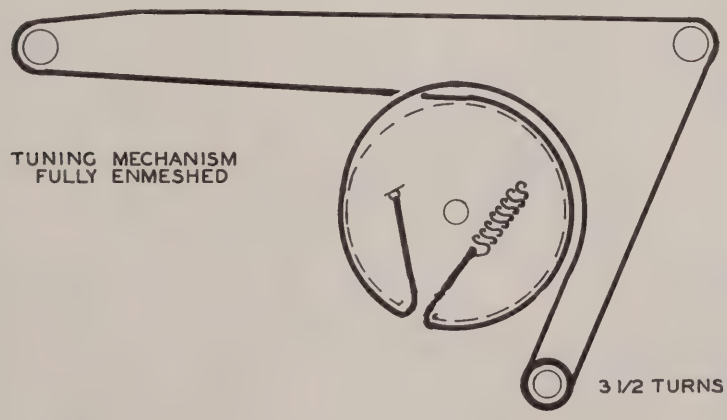
PROPERTY OF
L. F. MANKENSHIP
3024 ROSE ST
DENVER, COLORADO

RADIO RECEPTOR
MODEL C-1709-P UHF Conv.



RADIO RECEPTOR
MODEL C-1709-P UHF Conv.

TRADE NAME	Radio Receptor Model C-1709-P
MANUFACTURER	Radio Receptor Co., Inc., 84 N. Ninth St., Brooklyn, N.Y.
TYPE SET	AC Operated All Channel UHF Converter
TUBES (Three)	Types 6AF4 UHF Osc., 6BQ7A IF Amp., 6X4 Rectifier
POWER SUPPLY	110-120 Volts AC RATING .26 Amp. @ 117 Volts AC
TUNING RANGE	Channels 14 thru 84



DIAL CORD DRIVE

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

RADIO RECEPTOR
MODEL C-1709-P

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Radio Receptor PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	IF Amplifier	6BQ7A	6BQ7A	9AJ	
V3	Rectifier	6X4	6X4	5BS	

CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: Radio Receptor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	350		PRS450/40-40		BO45		2N537	TVA-2740	Yellow
B	40	350								Red
C2	9									
C3	470			BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C4	470			BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C5	100			BPD-0001	D6-101		GP1K-101	UC-531	5GA-T1	
C6	470			BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C7	470			BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C8	650									
C9	650									
C10	820	500								Note 1
C11	820	500								Note 1

Note 1. Some Models use 800MMF in this application.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: Radio Receptor PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R1	5600Ω	1		BTA-5600	
R2	8200Ω	2		BTB-8200	
R3	27Ω	1/2			
R4	1Meg	1/2		BTS-1Meg	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: Radio Receptor PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R5	100Ω	1/2		BTS-100	
R6	1000Ω	1/2		BTS-1000	
R7	1000Ω	1		BTA-1000	
R8	820KΩ	1/2		BTS-820K	Note

Note: Not used in all Models.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA: Radio Receptor PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @ .26A	238V .026 ADC	6.3V @ 1.18A						

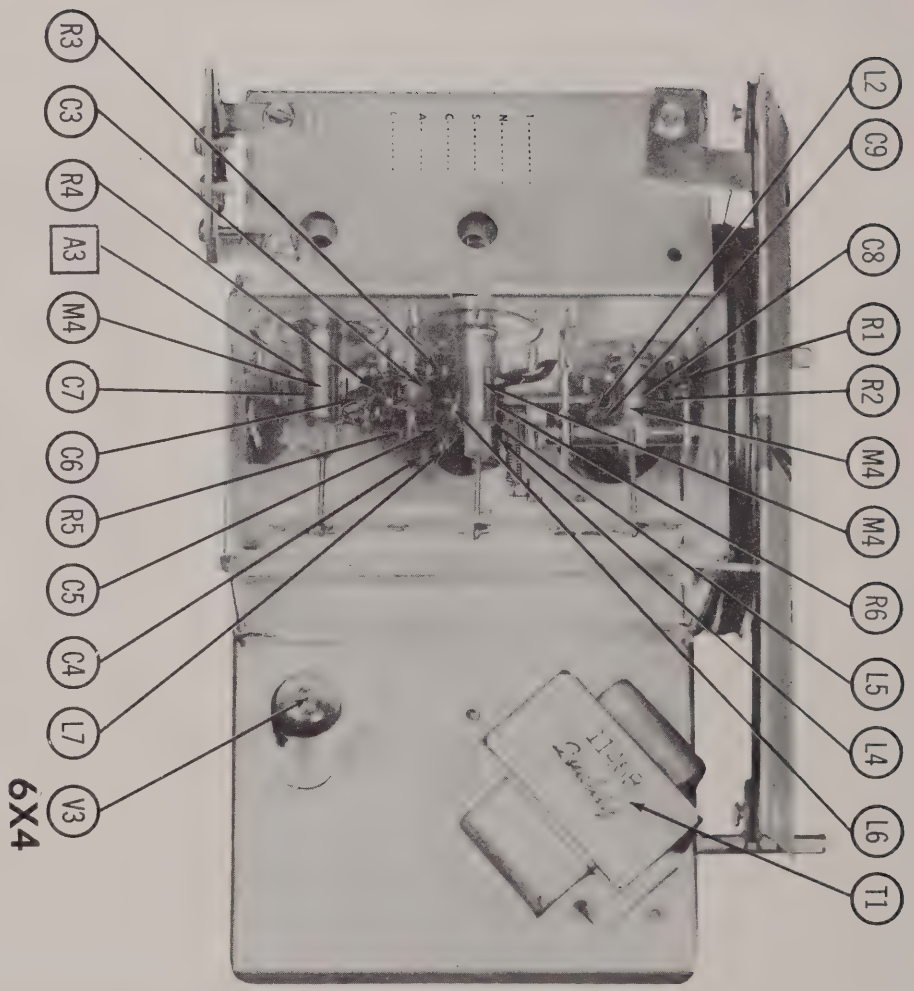
COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Radio Receptor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Fil. Choke	0Ω						
L2	Fil. Choke	0Ω						
L3	IF Input Coil Primary	0Ω						
L4	IF Input Coil Secondary	0Ω						
L5	IF Input Coil Mutual	0Ω						
L6	RF Choke	.1Ω						
L7	Neutr. Coil	.1Ω						
L8	IF Output Trans.	0Ω	0Ω					

MISCELLANEOUS

ITEM No.	PART NAME	Radio Receptor PART No.	NOTES
M1	Tuning Unit		Antenna
M2	Tuning Unit		Mixer
M3	Tuning Unit		Oscillator (Includes circuit components, less tube)
M4	Slug		Tuning, antenna, mixer and oscillator (3 Used)
M5	Crystal Diode		Mixer (1N82)
M6	Switch		Off-VHF-UHF Selector

CHASSIS—TOP VIEW



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The following equipment is required for proper alignment: (1) A sweep generator with 30MC sweep at 82MC center frequency. (2) A signal generator with range of from 60 to 100MC. (3) A good oscilloscope.
The following adaptors are required: (1) A balanced detector (Fig.1). (2) A crystal simulator (Fig.2). (3) A detector simulator (Fig.3).
When connecting adaptors use short leads. Remove the 1N82 crystal diode from its holding clips.
Connect the output of the signal generator to a small pickup loop to radiate the signal into the UHF Converter.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 2	Thru crystal simulator to 1N82 mounting clips as in Fig. 2.	82MC (30MC Swp)	95MC	Vert.Amp. thru detector (Fig.3) to pin 1 (V2). Note: Solder the detector lead to pin 1 terminal. Low side to chassis.	A1	Connect a short across secondary terminals 3 and 5 of L8. Adjust to place marker at 70% on high frequency side of response curve as in Fig. 4.
2.	"	"	"	69MC	"	L5, L3	Compress or expand L5 to place 69MC marker at 70% on response curve. If necessary compress or expand L3 for a symmetrical response as in Fig.4. Remove detector (Fig.3) from V2 and the short from L8.
3.	"	"	"	76MC 88MC	Vert.Amp. thru detector (Fig.1) to terminals 3 & 5 of L8.	A2, A3	Adjust for response curve similar to Fig.5.

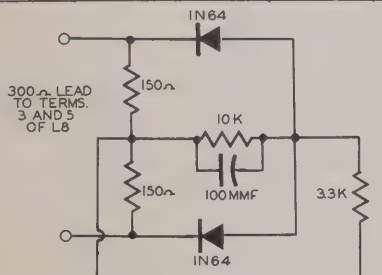


FIG. 1

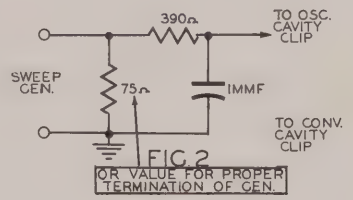


FIG. 2
OR VALUE FOR PROPER TERMINATION OF GEN.

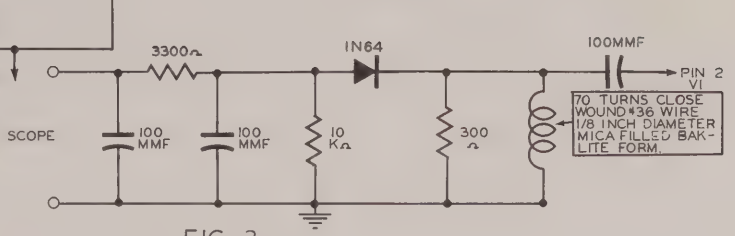


FIG. 3

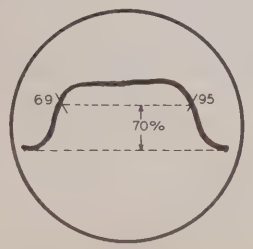


FIG. 4

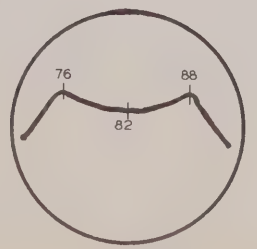
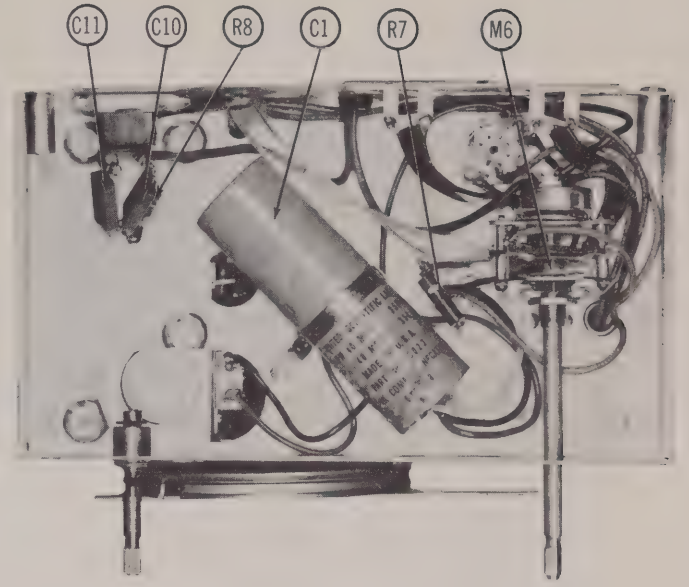
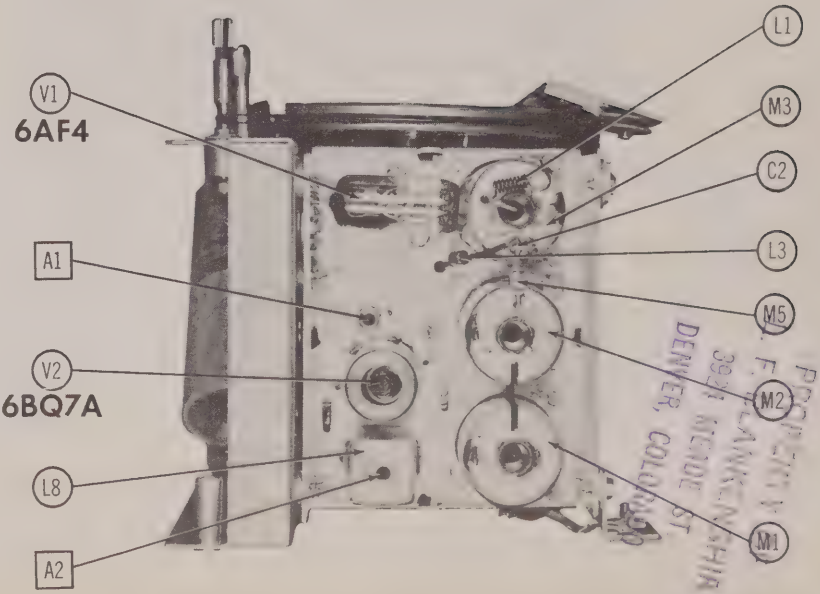


FIG. 5

CHASSIS—BOTTOM VIEW





PROPERTY OF
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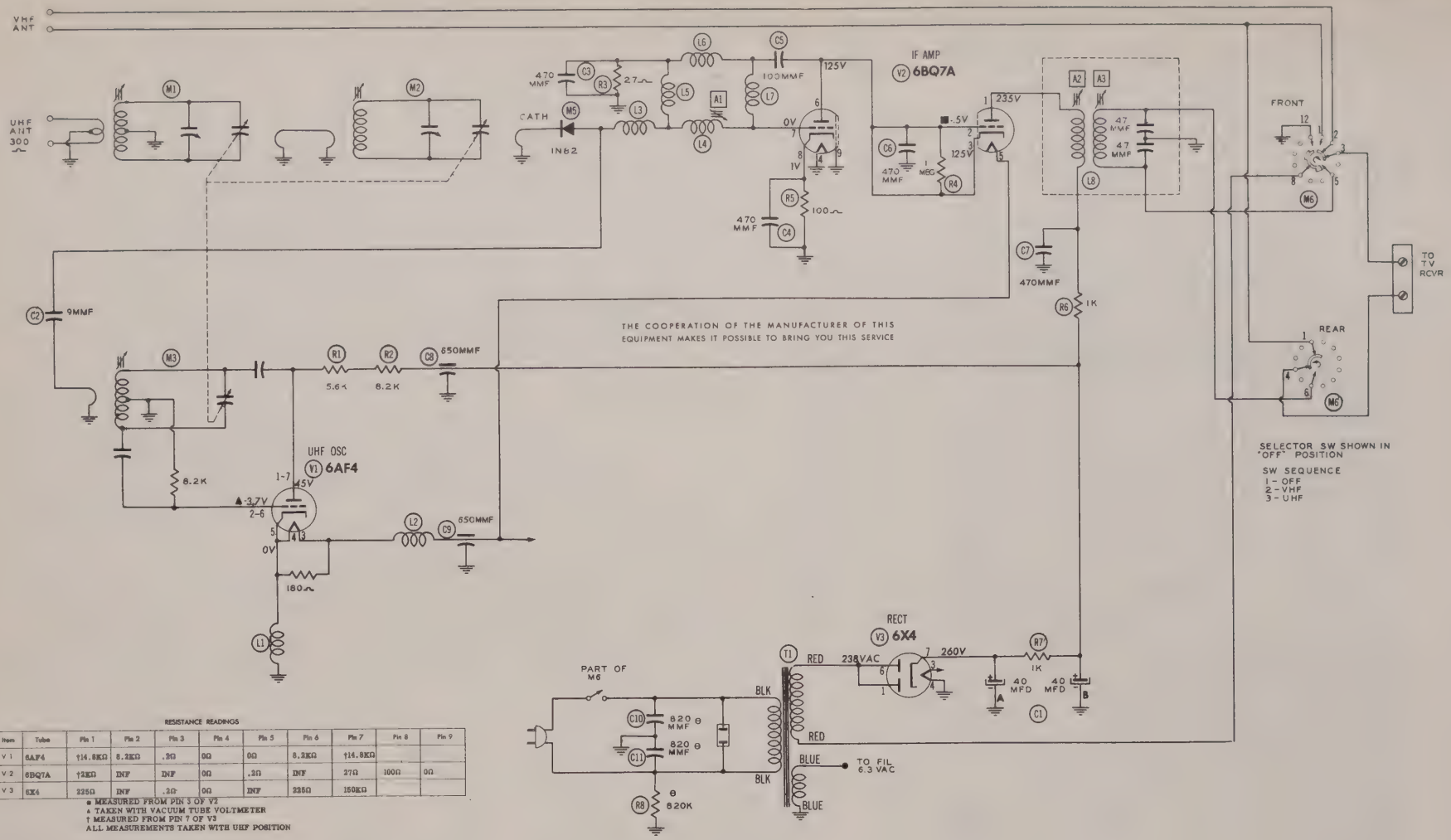
3991 MEADE ST
DENVER, COLORADO

RADIO RECEPTOR MODEL C-1709-P



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†14.8KΩ	8.2KΩ	.2Ω	0Ω	0Ω	8.2KΩ	†14.8KΩ		
V 2	6BQ7A	†2KΩ	INF	INF	0Ω	.2Ω	INF	27Ω	100Ω	0Ω
V 3	6X4	225Ω	INF	.2Ω	0Ω	INF	225Ω	150KΩ		

● MEASURED FROM PIN 3 OF V2
▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V3
ALL MEASUREMENTS TAKEN WITH UHF POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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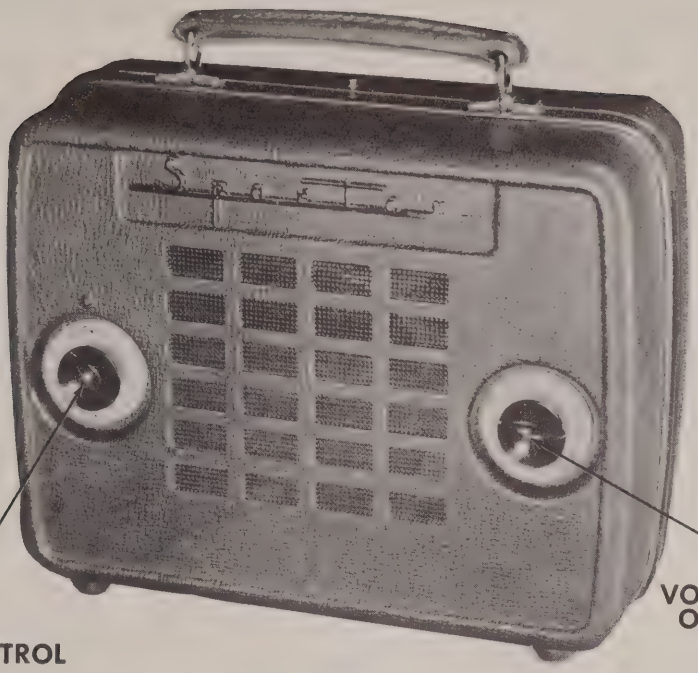
222-12

1 - DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.

PROPERTY OF
L. F BLANKENSHIP
3324 MEADE ST.
DENVER, COLORADO

SPARTON
MODELS 301, 305, 309 (Ch. 4E3)



SPARTON
MODELS 301, 305, 309 (Ch. 4E3)

TRADE NAME	Sparton Models 301, 305, 309
MANUFACTURER	Sparks Withington Co, Jackson, Michigan
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC-DC (or) 7.5 Volts "A" Supply & 90 Volts "B" Supply
RATING	.14 Amp. @ 117 Volts AC (or) 55MA @ 7.5 Volts DC & 16MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last referecne mark at low frequency end of dial. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	456KC (400%Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. If A5 has insufficient range, set A5 to center of its range and adjust trimmer at opposite side of gang.
3.		"	1500KC	Tune to 1500KC signal	"	A6	If A6 has insufficient range, set A6 to center of its range and adjust trimmer on opposite side of gang. Adjust for maximum deflection.
4.	Check calibration at 600, 1000 and 1500KC. If necessary repeat steps 2 and 3.						

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		SPARTON PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■30	150	PA4300-11	AFH3-09		CO07		FP311-4	TVL-3437	
B	▲20	150								
C	20	150								
C2	100	15	PA4308-3	PRS15/100		BRH151A		TC2501	TVA-1160	
C3	.25	200	PC40GK-254	P288-25		PJ2P5		PT4025	2TM-P25	
C4	1000		*PA4330-15		*PC33	TM5D1	GP2L-102		5GA-D1	
C5A	100		♦PA4329-1	♦PA98	♦PC50		♦1403-01		♦100C1	
B	100									
C6	1000		HK-35G102	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5GA-D1	
C7A	100									
B	5000		♦PA4333-1	♦PA116-2	♦PC-92		♦1407-02		♦103C3	
C	2000									
C8	.001	600	PC40GM-102	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C9	.05	400	40HL503	489ZX-05		PJ4S5		PT415	4TM-S5	
C10	.1	400	PC40GK-104	P488-1		PTE4P1		PT401	4TM-P1	
C11	10000		PA4334-2	BPD-01	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C12	10000		PA4334-2	BPD-01	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	

* Items C4 and R3 combined in one unit.
♦ Items C5A, C5B and R5 combined in one unit.
■ Items C7A, C7B, C7C, R7A, R7B, R7C combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	PA4460	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

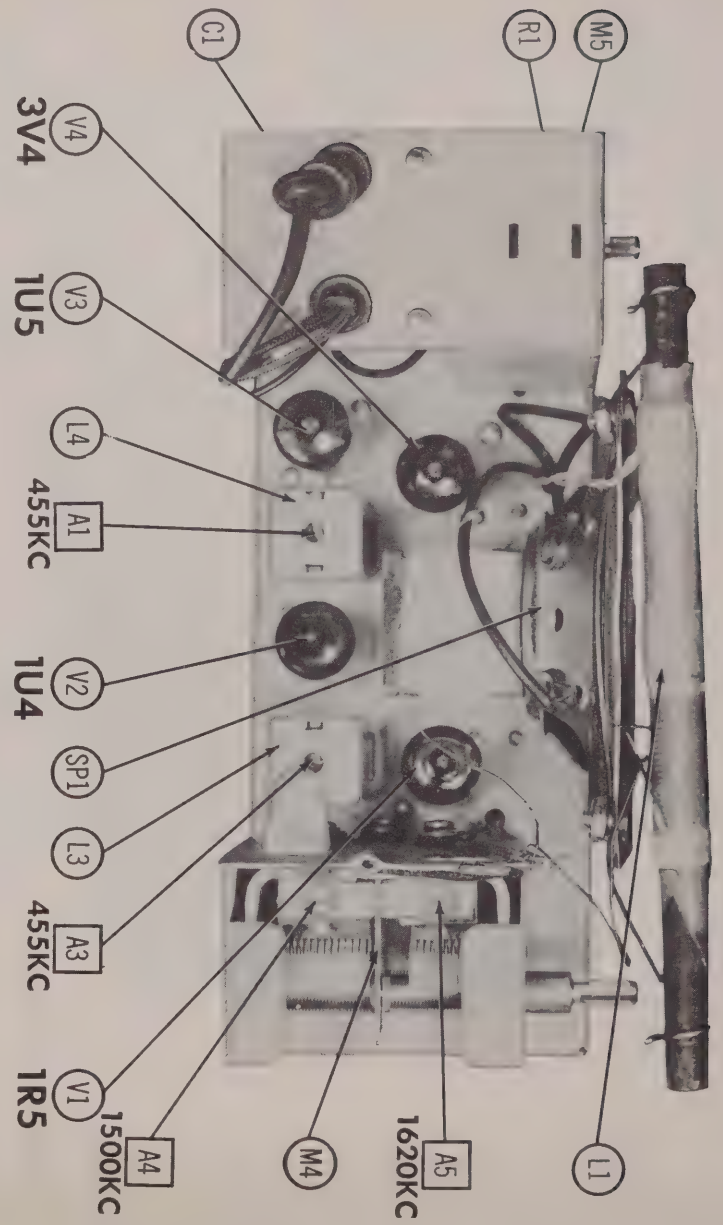
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SPARTON PART No.	IRC PART No.	
R2	100KΩ	½	BR12S-104	BTS-100K	
R3	10Meg	½	*PA4330-15	BTS-10Meg	
R4	3.3Meg	½	BR12S-335	BTS-3.3Meg	
R5	47KΩ	½	♦PA4329-1	BTS-47K	
R6	10Meg	½	BR12S-106	BTS-10Meg	
R7A	4.7Meg	½		BTS-4.7Meg	
B	1Meg	½	†PA4333-1	BTS-1Meg	
C	2.2Meg	½		BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SPARTON PART No.	IRC PART No.	
R8	2200Ω	½	BR12G-222	BTS-2200	
R9	390Ω	½	BR12G-391	BTS-390	
R10	180Ω	½	BR12G-181	BTS-180	
R11	120Ω	½	BR12G-121	BTS-120	
R12A	1200Ω	10	†PA4209		
B	1200Ω				
R13	2700Ω	½	BR12S-272	BTS-2700	
R14	47Ω	2	DR11S-470		

* Items R3 and C4 are combined in one unit.
■ Items R5, C5A, C5B are combined in one unit.
† Items R7A, R7B, R7C, C7A, C7B, C7C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	10KΩ	3.3Ω	350Ω	.75Ω	AB44064-2	A-3879	A-2932	RO-16	S-11X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SPARTON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	PC63000-23	ST-113 Mod. P4-X	4A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SPARTON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.2Ω		AB43592-5				
L2	Osc. Coil	1.5Ω	5Ω	AA6797-4	14-1073		69-Osc.*	
L3	Input IF	26Ω	26Ω	PB42201-1	16-6758	BC-352	12-C1	
L4	Output IF	26Ω	26Ω	PB42201-1	16-6758	BC-353	12-C2	

* Drill mounting holes.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	SPARTON PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.065ADC	PA4215A	NB5	5M4	1003A	6S75	75

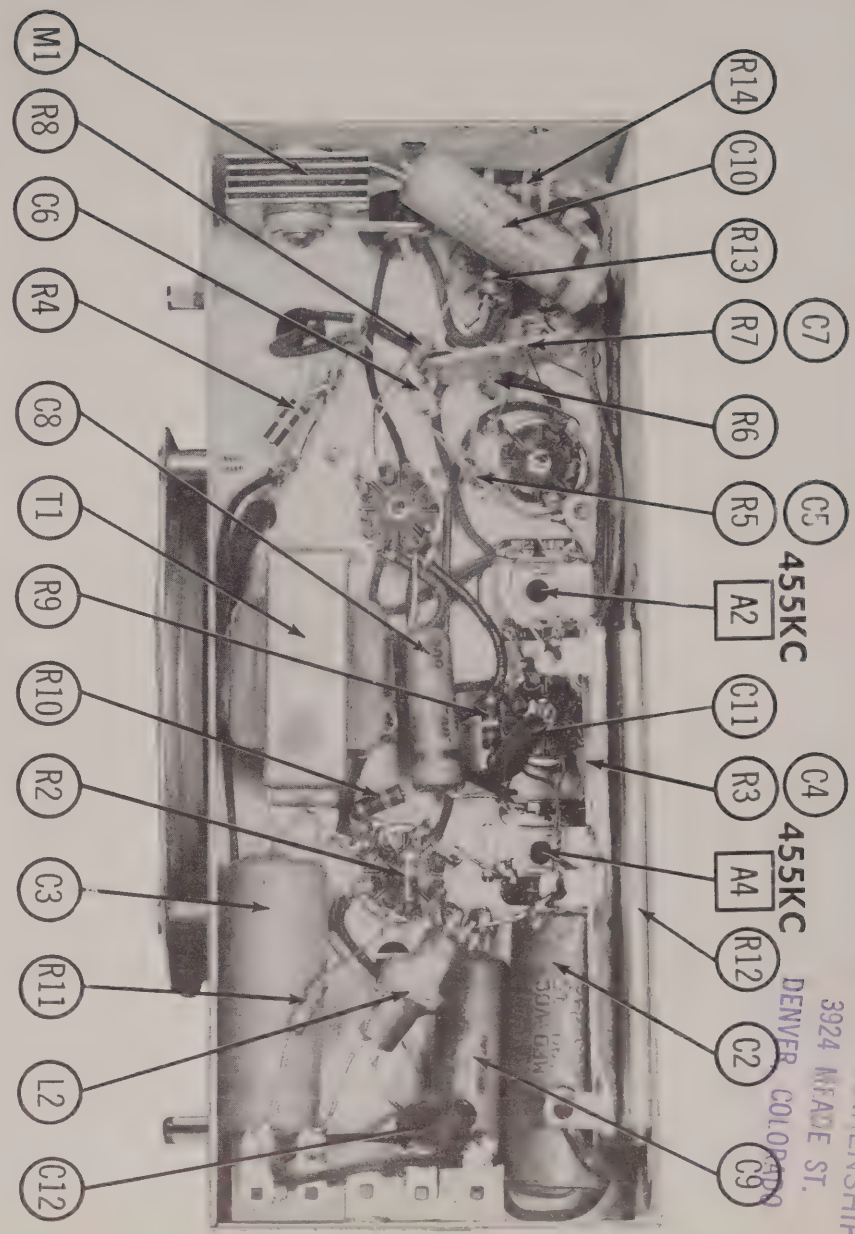
BATTERIES

ITEM No.	VOLTAGE	SPARTON PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2 M3	7.5V 45V		717	455		C5	XX30A		2 Used in series

MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M4	Tuning Cap.	PB40417	2 Gang Variable (45-447MMF, 35-200MMF)
M5	Switch	PB42012	Power Selector
	Cabinet	AD93241-1	Model 301 (Brown)
	Cabinet	AD93241-2	Model 305 (Green)
	Cabinet	AD93241-3	Model 309 (Ivory)
	Knob	PA5650	Control (2 used)
	Knob	PA5666	Tuning Indicator
	Knob	PA5665	Volume Indicator

CHASSIS—BOTTOM VIEW



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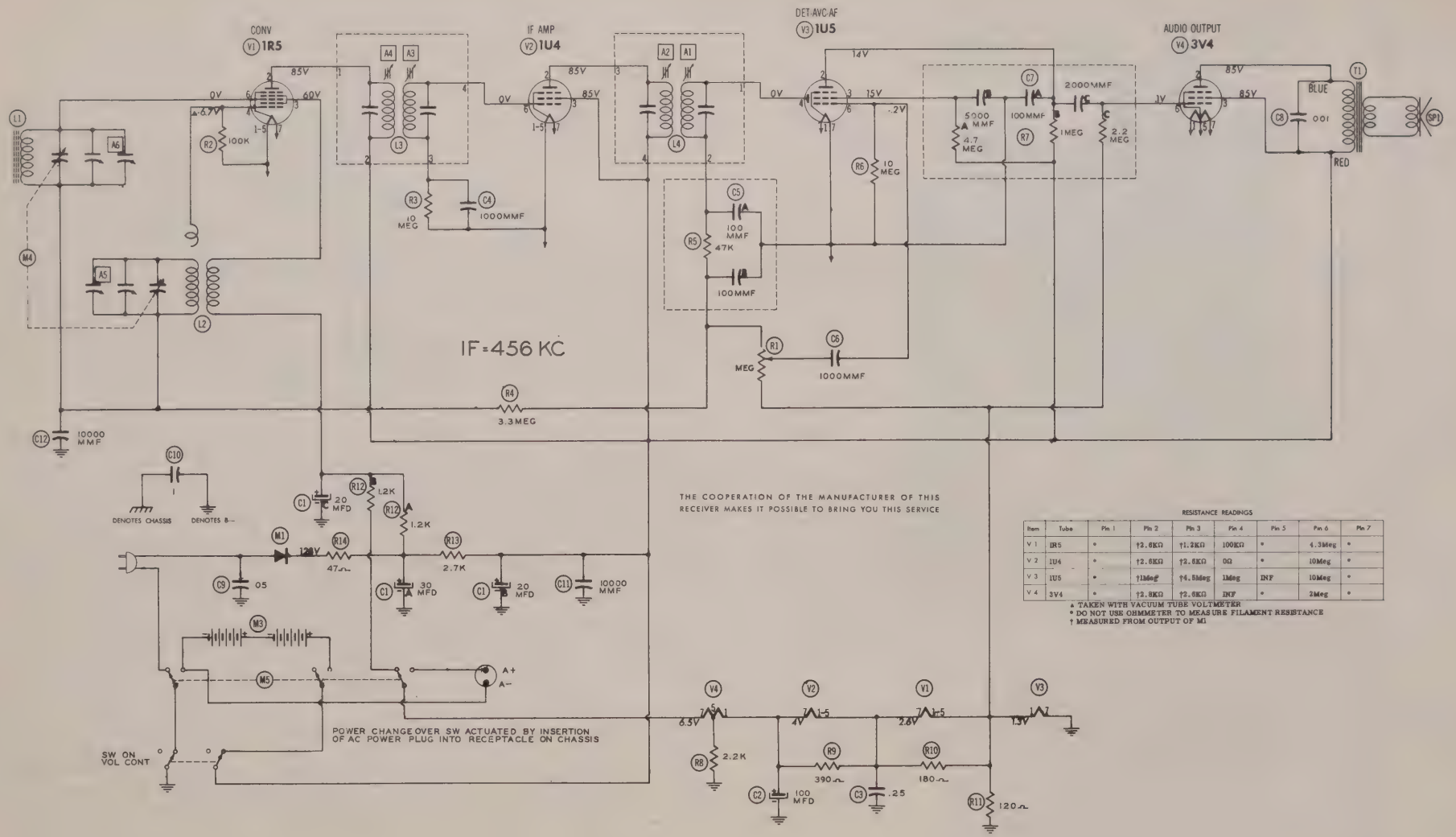
SPARTON MODEL 301 (Ch. 453)

SPARTON MODEL 301 (Ch. 453)

SET 999 FOLDER 13



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†3.6KΩ	†1.2KΩ	100KΩ	*	4.3Meg	*
V 2	1U4	*	†2.6KΩ	†2.6KΩ	0Ω	*	10Meg	*
V 3	1U5	*	†1Meg	†4.5Meg	1Meg	INF	10Meg	*
V 4	3V4	*	†2.8KΩ	†2.6KΩ	INF	*	2Meg	*

▲ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM OUTPUT OF M1

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222-13

1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

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MODEL 5326A

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DATE 11-53 SET 222 FOLDER 14

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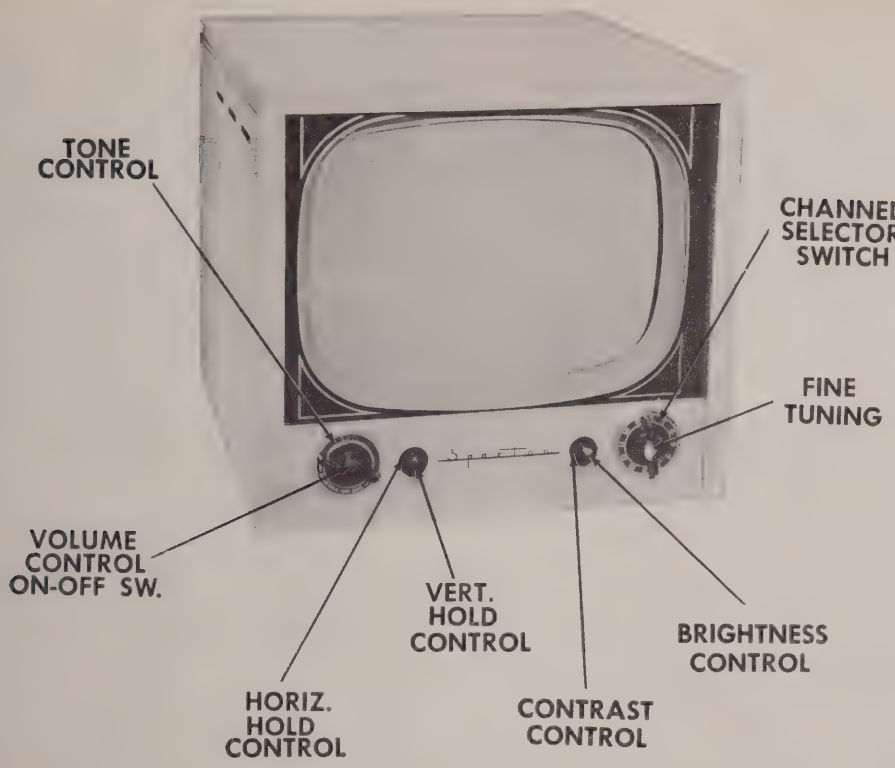

SPARTON MODEL 5326A

TRADE NAME	Sparton	MODELS	CHASSIS
		5325, 5326, 5362,5363	25D173A
		5325A, 5326A, 5362A, 5363A	27D173
MANUFACTURER	Sparks-Withington Co., Jackson, Michigan		
TYPE SET	Television Receiver		
TUBES	Twenty-seven		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 2.06 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13, Video IF 26.25MC, Sound IF 21.75MC (Intercarrier)		

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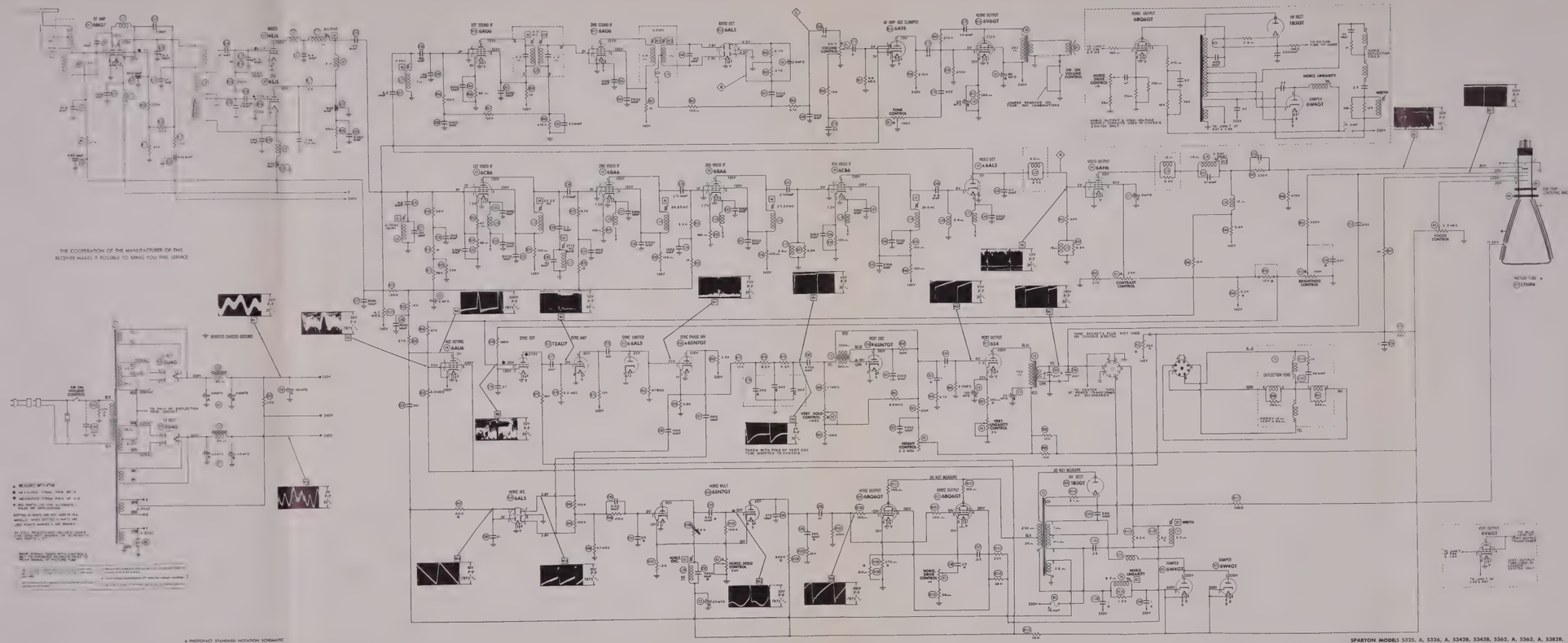
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SPARTON MODELS 5325, A, 5326, A,
5362, A, 5363, A (Ch. 25D173A, 27D173J)

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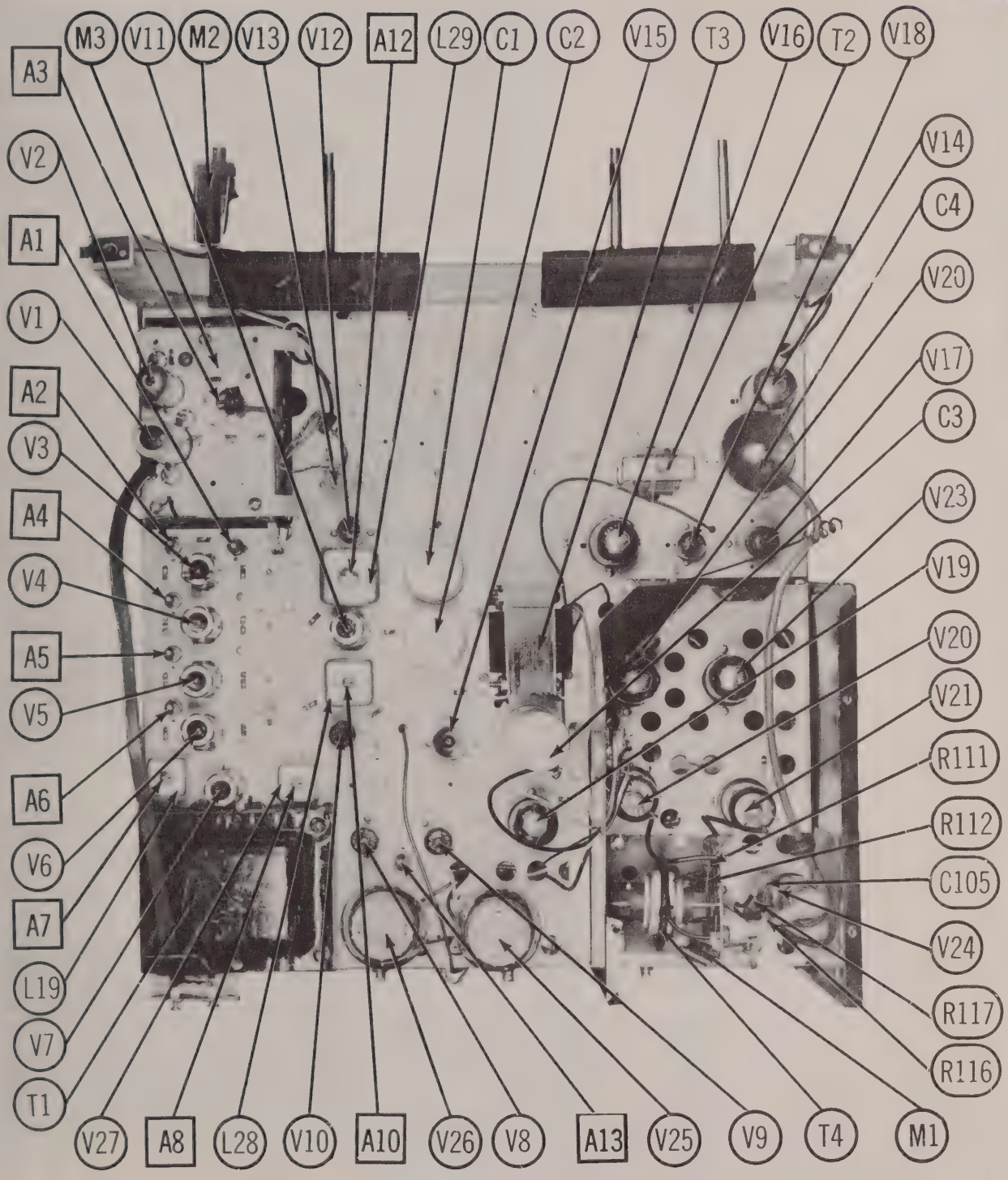

CHASSIS TOP VIEW

SET 222 FOLDER 14

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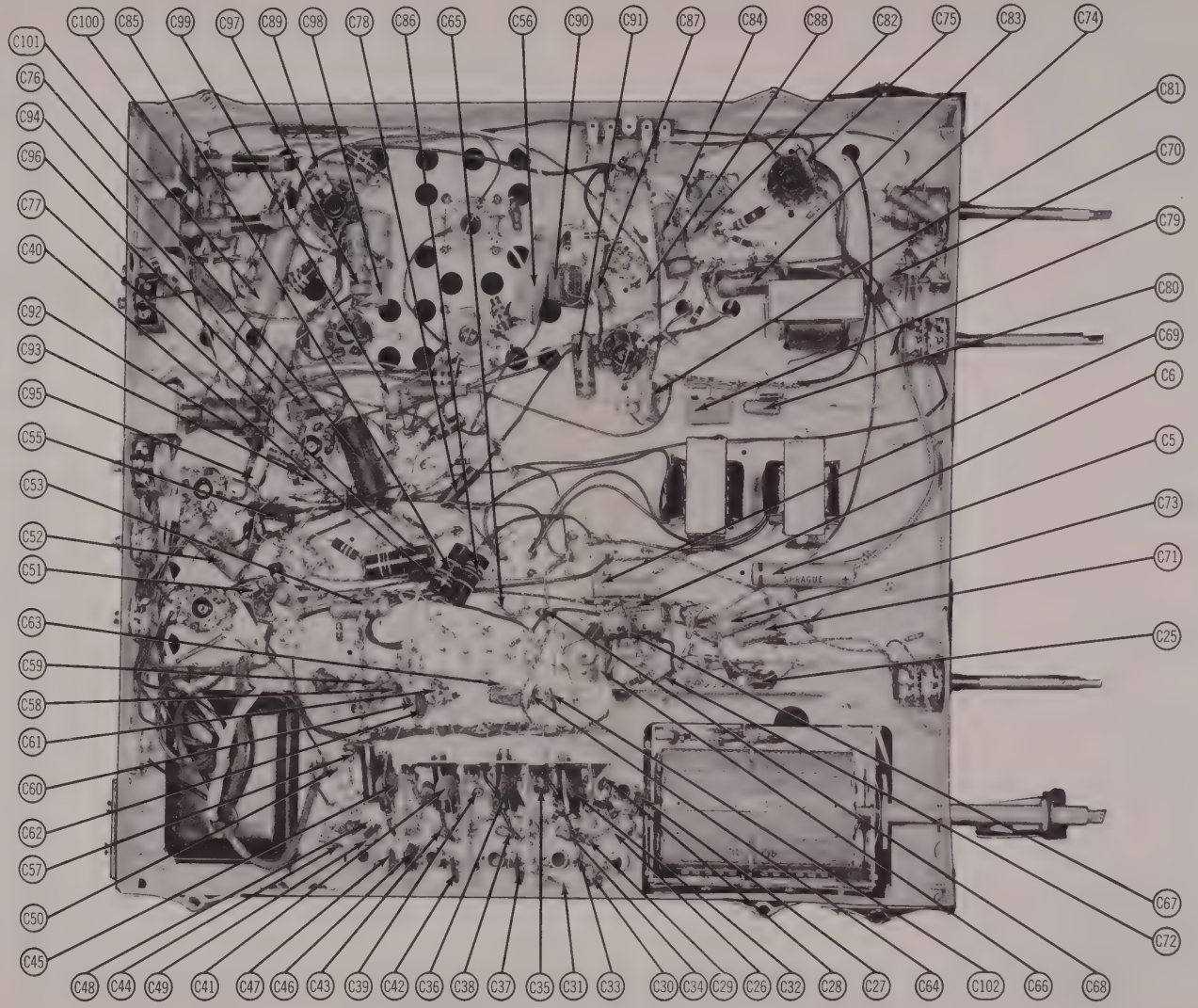
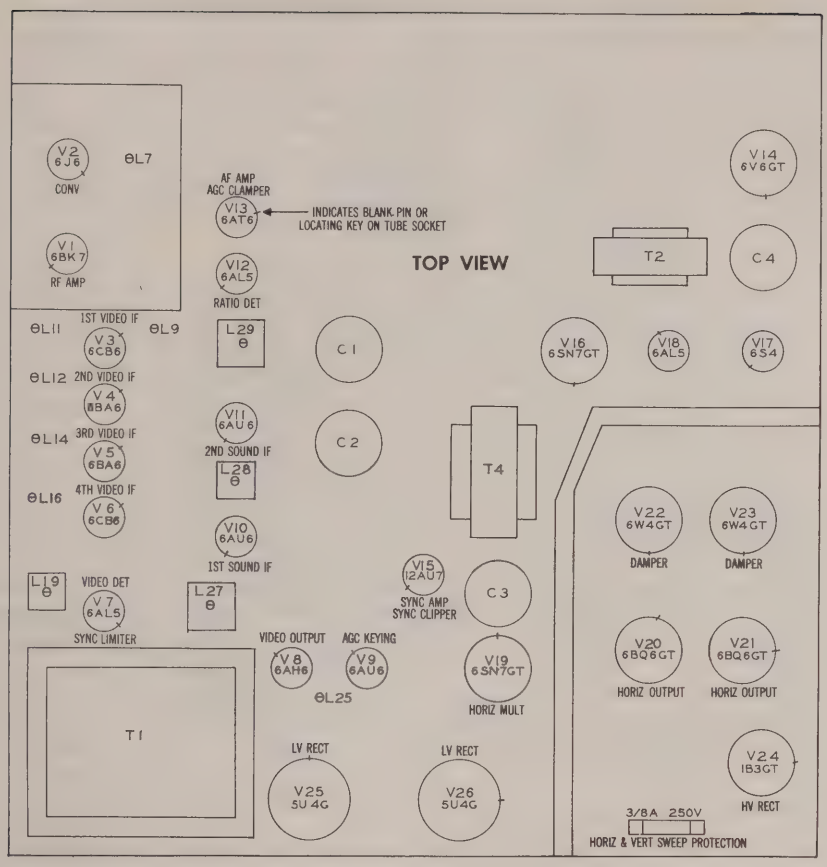


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V25, V26

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V7
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V8, V27
Has pic, no sound - V10, V11, V12, V13, V14
Overloaded picture - V9, V13

SYNC FAILURE
No vert. sync - V16, V17
No horiz. sync - V16, V18, V19
No vert. or horiz. sync - V7, V15, V16

SWEEP FAILURE
No raster, has sound - V19, V20, V21, V22, V23, V24, V27, Fuse (M1)
No vertical deflection - V16, V17
Poor vert. linearity or foldover - V16, V17
Poor horiz. linearity or foldover - V19, V20, V21, V22, V23
Narrow picture - V19, V20, V21, V22, V23, V24, V25, V26
Vert. off freq. - V16, V17
Horiz. off freq. - V16, V18, V19

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 4.5 volt battery to the ungrounded side of C5 . Connect the positive lead to chassis. Remove the keyer tube (V9) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	21.75 MC (unmod)	Any	DC probe to point (A) Common to chassis.	A1	Adjust for MINIMUM deflection.
2.		"	27.75MC	"	"	A2	"
3.			25.5MC	"	"	A3	Adjust for Maximum deflection.
4.			25.25MC	"	"	A4	"
5.			24.25MC	"	"	A5	"
6.			23.25MC	"	"	A6	"
7.			26.0MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Leave the 4.5 volt bias battery connected as under video IF alignment.
Connect a 47KΩ resistor in series with the high lead to the vertical amplifier of the scope. Connect a 50MMF capacitor across the input terminals of the vertical amplifier.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	24MC (10MC Swp)	22.7MC 25.5MC 26.25MC	Any	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary retouch A2 thru A6 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to pin 5 of 6AL5(V7). Low side to chassis.	4.5MC (unmod)	Any	DC probe to point (B) Low side to chassis.	A8, A9, A10, A11	Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point (C) Low side to chassis.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to pin 5 of 6AL5 (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A8, A9, A10, A11	Disconnect stabilizer capacitor C6. Adjust for curve of maximum amplitide and symmetry as in Fig. 2.
10.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A12	Reconnect stabilizer capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A10 for maximum amplitude and symmetry of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.01MFD	High side to pin 1(grid) of 6AH6 (V8). Low side to chassis.	4.5MC (unmod)	Any	DC probe thru crystal detector (Fig. 4) to pin 11 of picture tube. Common to chassis.	A13	Adjust for MINIMUM deflection. Remove dummy converter tube and replace original 6J6 in its socket. Replace keyer tube (V9) in its socket.

TUNER ALIGNMENT

The tuner portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field. If the tuner is definitely known to be mis-aligned return the entire tuner to the factory.

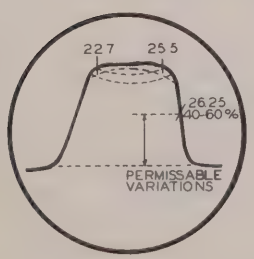

FIG. 1

FIG. 2

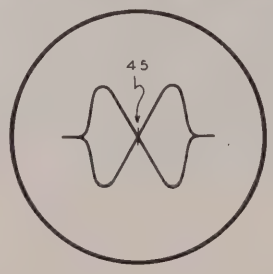

FIG. 3

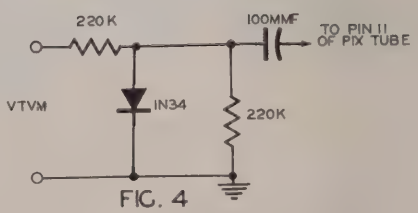

FIG. 4

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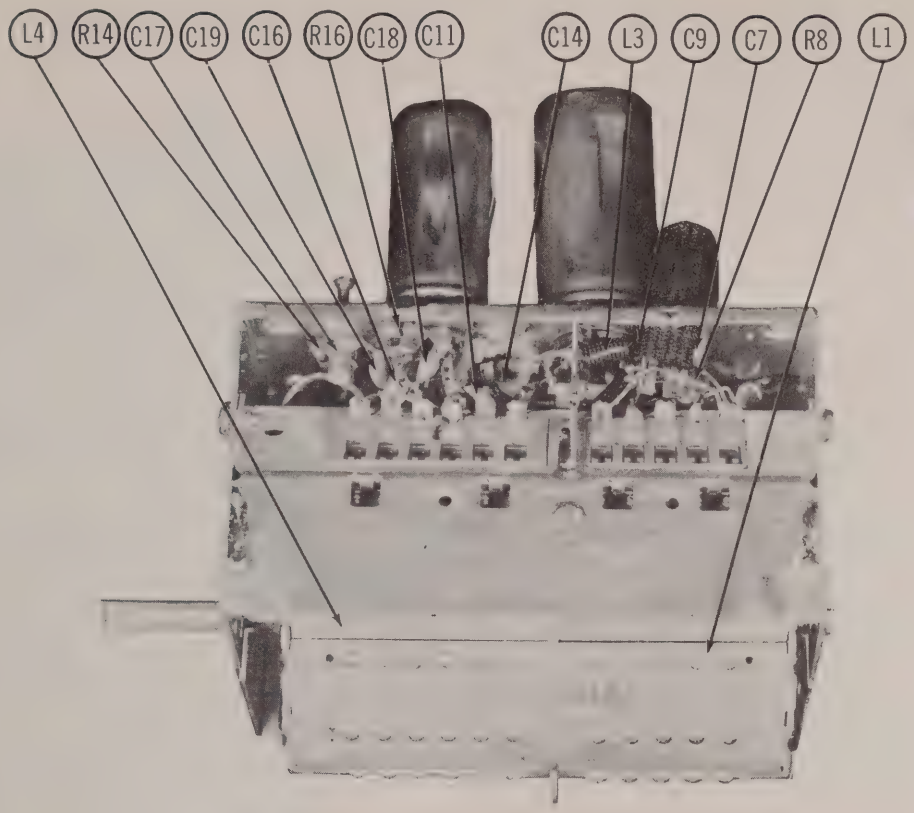
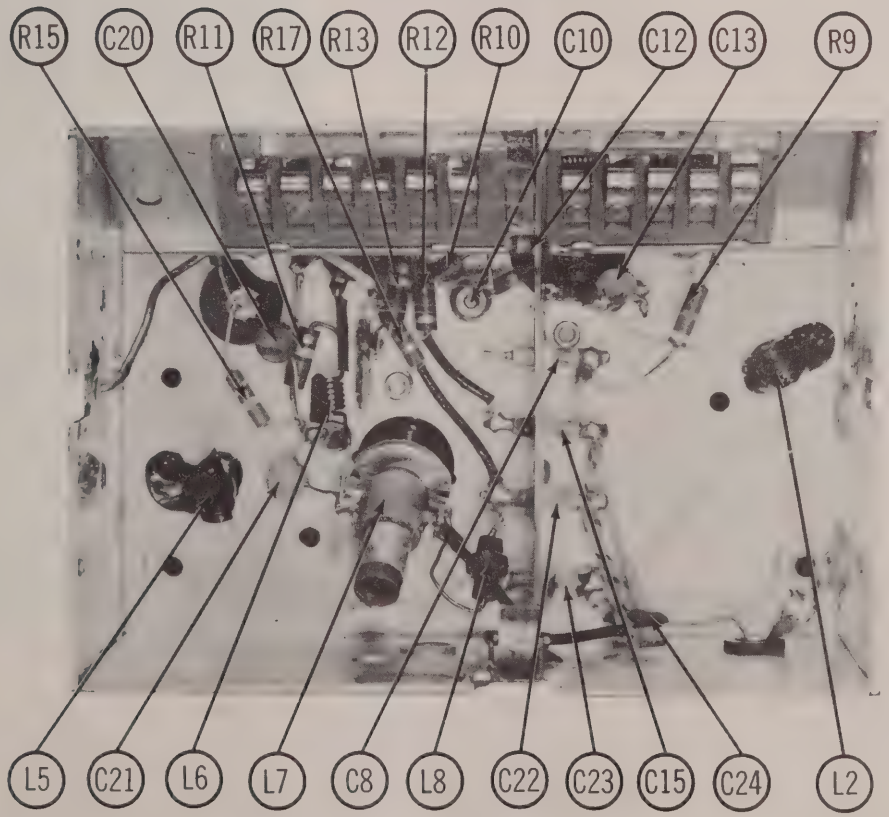


RF TUNER-RIGHT SIDE

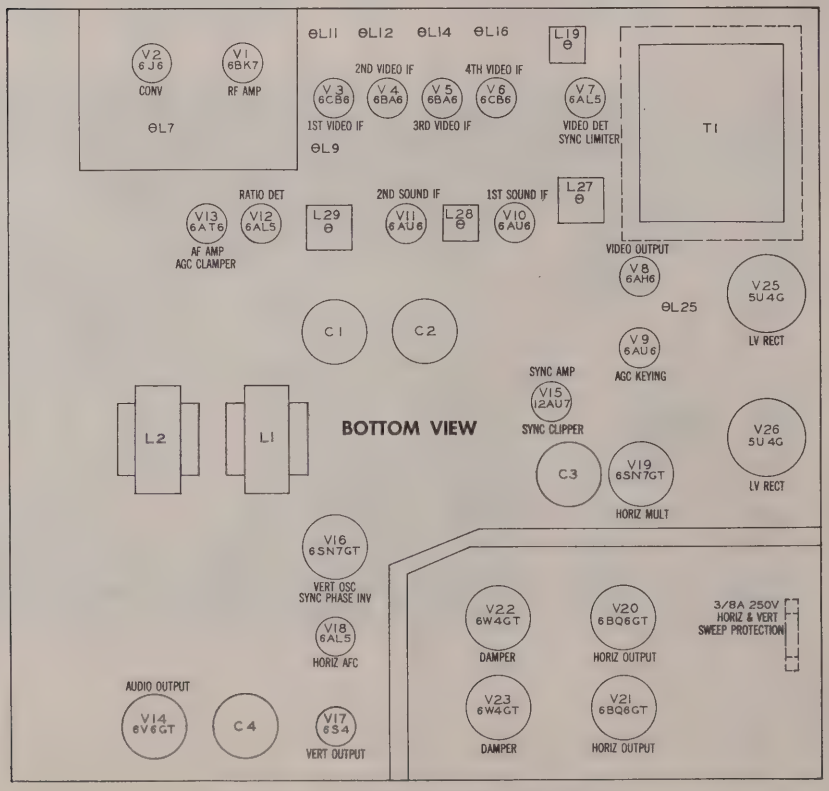


RF TUNER-BOTTOM VIEW

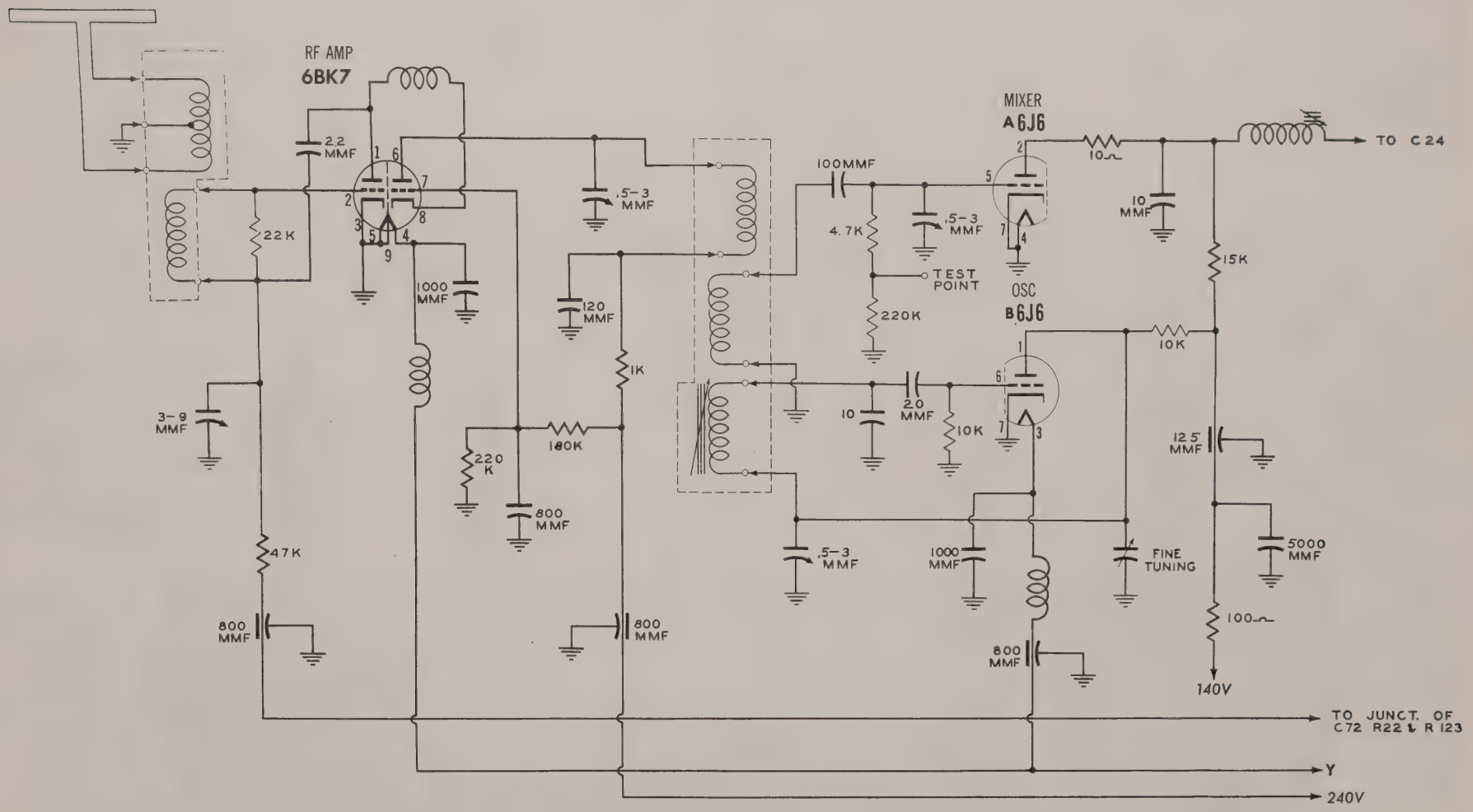
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	INF	220KΩ	0Ω	.1Ω	0Ω	■3KΩ	■180KΩ	INF	0Ω
V 2	6J6	♦17KΩ	♦200Ω	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	37KΩ	130Ω	0Ω	.1Ω	♦200Ω	♦200Ω	80Ω		
V 4	6BA6	95KΩ	0Ω	0Ω	6.3Ω	♦200Ω	♦200Ω	100Ω		
V 5	6BA6	95KΩ	0Ω	0Ω	.1Ω	♦200Ω	♦200Ω	100Ω		
V 6	6CB6	2.8Ω	120Ω	0Ω	.1Ω	♦300Ω	♦200Ω	0Ω		
V 7	6AL5	0Ω	4KΩ	0Ω	.1Ω	2.8Ω	0Ω	4.7Meg		
V 8	6AH6	4KΩ	0Ω	0Ω	.1Ω	♦5.7KΩ	♦7.5KΩ	0Ω		
V 9	6AU6	♦63KΩ	♦100Ω	0Ω	.1Ω	130KΩ	▲68KΩ	♦100Ω		
V 10	6AU6	670KΩ	0Ω	.1Ω	0Ω	♦1KΩ	♦1KΩ	82Ω		
V 11	6AU6	470KΩ	0Ω	0Ω	.1Ω	♦1KΩ	♦1KΩ	0Ω		
V 12	6AL5	INF	INF	0Ω	.1Ω	4.7KΩ	0Ω	4.7KΩ		
V 13	6AT6	6.8Meg	0Ω	0Ω	.1Ω	240KΩ	240KΩ	■270KΩ		
V 14	6V6GT	INF	.1Ω	■1.8KΩ	■1.5KΩ	470KΩ	270KΩ	0Ω	390Ω	
V 15	12AU7	▲28KΩ	♦15KΩ	200KΩ	.1Ω	.1Ω	♦12KΩ	2.2Meg	0Ω	0Ω
V 16	6SN7GT	4.7Meg	■3.4KΩ	3.9KΩ	1.3Meg	▲120KΩ	0Ω	0Ω	.1Ω	
V 17	6S4	INF	1.2KΩ	2.2Meg	.1Ω	0Ω	2.2Meg	INF	INF	▲5.7KΩ
V 18	6AL5	22KΩ	22KΩ	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 19	6SN7GT	5.2Meg	▲15KΩ	1.2KΩ	120KΩ	▲210KΩ	1.2KΩ	0Ω	.1Ω	
V 20	6BQ6GT	INF	0Ω	INF	■19KΩ	470KΩ	470KΩ	.1Ω	85Ω	TOP CAP ▲135Ω
V 21	6BQ6GT	INF	0Ω	500Ω	■19KΩ	470KΩ	INF	.1Ω	85Ω	TOP CAP ▲135Ω
V 22	6W4GT	INF	INF	200KΩ	200KΩ	100Ω	INF	200KΩ	200KΩ	
V 23	6W4GT	INF	INF	200KΩ	100KΩ	100Ω	INF	200KΩ	200KΩ	
V 24	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP ▲285Ω
V 25	5U4G	.1Ω	28KΩ	INF	19Ω	INF	20Ω	INF	28KΩ	
V 26	5U4G	INF	100KΩ	3.2Ω	25Ω	470KΩ	24Ω	INF	100KΩ	
V 27	17HP4	.1Ω	380KΩ	PIN 6 80Ω	PIN 10 ▲68KΩ	PIN 11 ♦140KΩ	PIN 12 0Ω			

■ MEASURED FROM PIN 8 OF V26
♦ MEASURED FROM PIN 8 OF V25
▲ MEASURED FROM PIN 3 OF V22



TUBE PLACEMENT CHART



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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TUNER USED ON CHASSIS 25D173A

ALTERNATE TUNER SCHEMATIC

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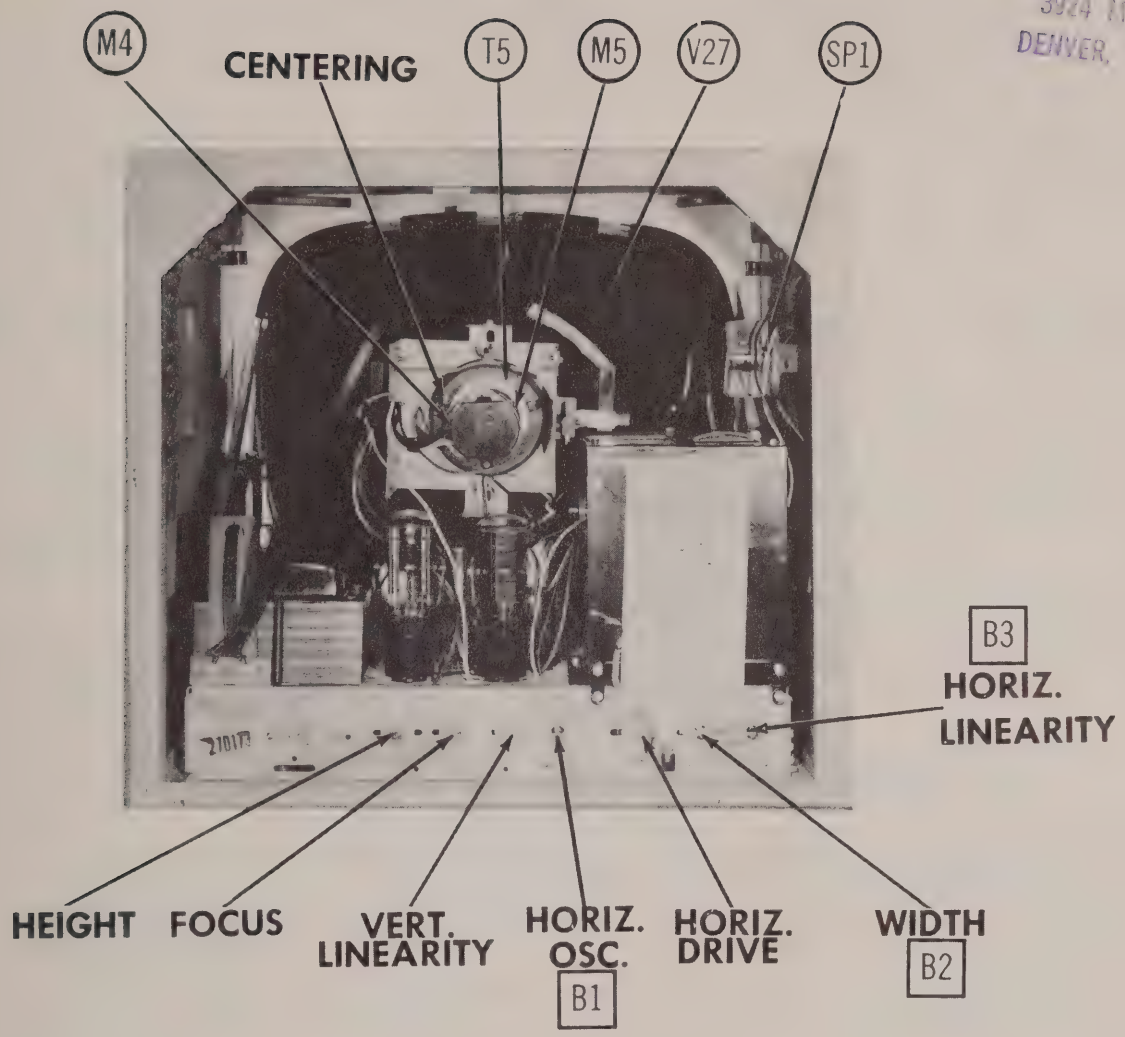
3924 MEADE ST.
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the mid-point of its range and adjust the horizontal oscillator slug (B1) until the picture synchronizes horizontally.

Turn the horizontal drive control to its maximum clockwise position without compression of the center of the picture.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrial from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

See "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V19, V20, V21, V22, V23, V25 and V26. Check adjustment of horizontal drive control, B2 and B3. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check C97, R113, R114, R120, R121, R118, C99, C100, T3, T5A and other associated circuit components.	Check R115, R104, R102, R101, R100, C92, C93, C94, C95, L30, R2A and other associated components.

DRIVE LINES

Check adjustment of horiz. drive control. Check by substitution V19, V20, V21, V22 and V23. Check 98, T3, T5A, C99 and C100.

COMPRESSED LEFT SIDE

Check adjustment of horiz. drive control, B2 and B3. Check by substitution V19, V20, V21, V22 and V23. Check T3, T5A and other associated circuit components.

FOLDS

Substitute V22 and V23. Check damper filter components.

XMAS TREE EFFECT

Substitute V19. Check C92, C93, C94, and L30.

VERTICAL

LOSS OF SWEEP

Check by substitution V16 and V17. Check waveform W10.

If Satisfactory	If unsatisfactory
Check T4, T5B, R87, R6 and other associated components.	Check R88, R89, R83, R86, C81, C82, C83, C84, T2 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V16 and V17. Check adjustment of height and vertical linearity controls. Follow procedure outlined under "Loss of Sweep"

COMPRESSED AT BOTTOM

Check by substitution V16 and V17. Check R5, R83, T2, C82, C83, C84 and other associated circuit components.

COMPRESSED AT TOP

Check by substitution V16 and V17. Check C3B, C4C, T4, T5B and other associated circuit components.

FOLDS

Check by substitution V16 and V17. Check associated components especially R86 and C84.

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V18 and V19. Check R95, R96, R97, R98, R100, R101, R102, L30, R2A, R104, C87, C88, C89, C90, C91, C92, C93, C94 C95, T3 and other associated components.

CRITICAL HOLD

Follow procedure outlined under "Loss of Sync".

HORIZONTAL BENDING OR S-ING

Check by substitution V19, V20 and V21. Check horizontal AFC filter network (C90, C91, R98, R99).

VERTICAL

LOSS OF SYNC

Check by substitution V15 and V16. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check T2, R80, R81, R82, R2B C80, C81 and C82.	Check vertical integrator network, C77, C78 and other associated circuit components.

CRITICAL HOLD

Follow procedure outlined under "Loss of Sync".

TRIGGERING

Check by substitution V15 and V16. Check circuit near these stages for filament lead dress.

VIDEO

LOSS OF VIDEO

Substitute V8. Check picture tube (V27). Check components associated with V8 and V27.

SOUND BARS (4.5 MC BEAT)

Check adjustment of local oscillator. Check adjustment of sound take-off A8 and 4.5 MC trap A13. Check video IF alignment.

POOR CONTRAST

Substitute V7 and V8 Check associated circuit components. Check picture tube.

NEGATIVE PIX

Check by substitution V7, V8, and V9. Check waveform W1 for signal overload.

If Satisfactory	If Unsatisfactory
Check components associated with V7, V8 and V9.	Check video IF tubes and alignment.

SMEAR

Check by substitution V7 and V8. Check L22 and L24. Check R44, R45, R48, R43 and R3A for change of value. Check V27 and other associated circuit components.

WIDE BLACK BAR ACROSS PIX

Check V1, V2, V3, V4, V5, V6, V7 and V8 for heater to cathode leakage.

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3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		SPARTON PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6BA6	6BA6	7BK	
V5	3rd. Video IF Amp.	6BA6	6BA6	7BK	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector Sync Limiter	6AL5	6AL5	6BT	
V8	Video Output	6AH6	6AH6	7BK	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V11	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V12	Ratio Detector	6AL5	6AL5	6BT	
V13	AF Amplifier-AGC Clamper	6AT6	6AT6	7BT	
V14	Audio Output	6V6GT	6V6GT	7S	
V15	Sync Amplifier-Sync Separator	12AU7	12AU7	9A	
V16	Sync Phase Inverter-Vertical Oscillator	6SN7GT	6SN7GT	8BD	
V17	Vert. Output	6S4	6S4	9AC	
V18	Horiz. AFC	6AL5	6AL5	6BT	
V19	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V20	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V21	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V22	Damper	6W4GT	6W4GT	4CG	
V23	Damper	6W4GT	6W4GT	4CG	
V24	HV Rectifier	1B3GT	1B3GT	3C	
V25	LV Rectifier	5U4G	5U4G	5T	
V26	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA			RTMA BASE TYPE	NOTES
	SPARTON PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.		
V27A	17HP4	17HP4	17HP4	12C	
		17RP4	17RP4	12C	
B	17KP4				
C	21FP4	21FP4	21FP4	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■40	250	PA4307-21	AFH3-43		CO34		FP376.8	TVL-3785	
B	▲40	250								
C	▲10	200								
C2A	▲40	475	PA4307-13	AFH2-72		BO53		FP262	TVL-2830	
B	▲40	475								
C3A	▲40	475	PA4307-22	AFH3-50		CO40		FP476	TVL-4840	
B	■20	450		PRS450/20		BR2045A				
C	▲20	450								
C4A	▲80	450	PA4307-23	AFH4-87		C109			TVL-3704	
B	▲20	50				BR205A				
C	■100	50								
C5	2	50	PA4303-14	PRS150/4		BBR2-50T		TC302	TVA-1301	
C6	5	50	PA4308-2	PRS150/4		BR550		TC30	TVA-1303	
C7	3-9				829-10					
C8	800			EF-001	MFT-1000				503C-D1	
C9	3			SI3NP0	TCZ-3		NP0K-030			
C10	.5-3				829-3			CT565A		
C11	47			BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C12	800			EF-001	MFT-1000				503C-D1	
C13	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C14	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C15	800			EF-001	MFT-1000				503C-D1	
C16	47			BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C17	.5-3				829-3			CT565A		
C18	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C19	5			SI5N750	TCN-5		N750K-050		5TCUB-V5	
C20	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C21	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C22	800			EF-001	MFT-1000				503C-D1	
C23	800			EF-001	MFT-1000				503C-D1	
C24	120			BPD-00012	D6-121	TM5T1	GP2K-121	UC-5312	5GA-T12	
C25	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C26	6.8		PA4328-13	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C27	100		PA4332-3	SI100NP0	TCZ-100		NP0-333-101	ZT-531	5TCC-T1	
C28	1000		HK36M-102	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5GA-D1	
C29	3.3		PA4326-4	SI3.3NP0	TCZ-3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C30	100		PA4332-3	SI100NP0	TCZ-100		NP0-333-101	ZT-531	5TCC-T1	
C31	5000		PA4334-1	BPD-005	MD-502	TM5D 5	811-005	DC-525	5HK-D5	
C32	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C33	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C34	270		HK36M-271	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C35	1000		HK36M-102	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C36	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C37	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C38	270		HK36M-271	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C39	1000		HK36M-102	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C40	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C41	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C42	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C43	270		HK36M-271	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C44	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	

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PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
			REPLACEMENT DATA							
C45	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C46	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C47	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C48	6.8		PA4328-13	SH.5NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C49	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C50	4.7		PA4328-11	SH.7NP0	TCZ-4.7		NP0K-4R7	ZT-555	5TCCB-V47	
C51	47		CC30A-47GF	SH7NP0	TCZ-47		NP0K-470	ZT-5447	5TCC-Q47	
C52	.1	400	PC40GL-104	P488-1	DF-104	PTE4P1		PT401	47M-P1	
C53	.003	600	PC40GM-302	P686-003	D6-302	PTE6D3	GP2-333-302	PT603	6TM-D3	
C54	.047	400	PC40HL-503	P488-047	DF-503	PTE4S7		PT4Y7	47M-S47	Note 1
C55	.001	600	PC42GM-102	P686-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C56	.1	600	PC40GM-104	P686-1	DF-104	PTE6P1		PT601	6TM-P1	
C57	2.2		PA4328-8	SH.2N2D	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C58	100		PA4333-3	SIJ00	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C59	100		PA4332-3	SIJ00	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C60	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C61	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C62	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C63	33	500	MC50E-330							
C64	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C65	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C66	120		PA4332-4	SIJ02N0			NP0-332-121	ZT-5312	5TCC-T12	
C67	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C68	1000		HK36M-102	SIJ000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C69	.02	400	PC40HL-203	P488-02	DF-203	PTE4S2		PT413	47M-S2	
C70	.03	200	PC40GK-303	P488-03		PTE4S3		PT413	47M-S3	
C71	.01	400	PC40HL-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	47M-S1	
C72	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C73	.02	600	PC40HL-203	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C74	.005	600	PC40GM-502	P686-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C75	68	500	MC50E-680				GP1K-680	UC-5468	5GA-Q68	
C76	.47	200	PC42DK-474	P288-47		PT2P5		PT405	2TM-P47	
C77	.047	600	PC40GM-503	P686-047	DF-503	PTE6S47		PT6147	6TM-S47	
C78	.001	800	PC42GM-102	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C79A	.002		PA4339-4	P688-002	D6-202	PTE6D2	GP2-333-202	PT622		
B	.005			P688-005	D6-502	PTE6D5	GP2-333-502	PT625	34C17	
C	.005			P688-005	D6-502	PTE6D5	GP2-333-502	PT625		
C80	4700	500	MC61F-472	1464-005		IDR5D5		MCB465	MS-25	
C81	2000	500	MC61E-202	1464-002		IRD5D		MCB457	MS-22	
C82	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C83	.1	400	PC40GL-104	P488-1	DF-104	PTE4P1		PT401	47M-P1	Note 2
C84	.1	400	PC40GL-104	P488-1	DF-104	PTE4P1		PT401	47M-P1	
C85	.047	400	PC40HL-503	P488-047	DF-503	PTE4S47		PT4147	47M-S47	Note 3
C86	.047	400	PC40HL-503	P488-047	DF-503	PTE4S47		PT4147	47M-S47	Note 3
C87	1000	500	MC61E-102	1464-001	D6-102	IWD1	GP2L-102	MC255	1FM-21	
C88	1000	500	MC61E-102	1464-001	D6-102	IWD1	GP2L-102	MC255	1FM-21	
C89	.01	400	PC40FL-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	47M-S1	
C90	5100	500	MC61E-512							
C91	.05	200	PC40HL-503	P288-05	DF-503	PT2E5		PT415	2TM-E5	Note 4
C92	3900	500		1464-004		IDR5D4		MCB463	MS-24	Note 5
C93	220	500								Note 6
C94	270	500	MC60E-271							
C95	3900	500		1469-0004		5R5T4		MCB243	MS-24	Note 6
C96	.01	400	PC40GL-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	47M-S1	
C97	.05	400	PC40HL-503	P488-05	DF-503	PTE4S5		PT415	47M-S5	
C98	200	200	PC40GL-254	P488-25		PT2P25		PT4025	2TM-P25	Note 7
C99	.1	400	PC40GL-104	P488-1		PTE4P1		PT401	47M-P1	Note 2
C100	.1	400	PC40GL-104	P488-1		PTE4P1		PT401	47M-P1	Note 2
C101	.25	400	PC40GL-254	P488-25		PTE4P25		PT4025	47M-P25	
C102	5000		PA4334-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C103	56	2000	PA4334-5							
C104	.047	600	PA4348-1	689ZX-05		PJ8S47		PT6147	6TM-S47	Note 8
C105	500	20000	PA4342-2	HV20C	TV7-503	MM-C20TS	413-501	HV20035A	20DK-T5	

Note 1. Not used in all Models.
Note 2. Ch. 25D173A use .05MFD in this application (part #PC40GL-503)
Note 3. Some chassis combine C85 and C86 in one .1MFD unit. (part #PC42GK-104)
Note 4. Ch. 25D173A use .068MFD in this application (part #PA4334-2)
Note 5. Ch. 25D173A use 3300MMF in this application (part #MC63F-332)
Note 6. Ch. 25D173A use 270MMF in this application (part #MC60E-271)
Note 7. Ch. 25D173A use .47MFD in this application (part #PC42GK-474)
Note 8. Used in Ch. 25D173A only.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
			REPLACEMENT DATA					
R1A	1Meg	½	PA4450-1	QJ-189 ♦	RTY-318		UF16L	Tone - Panel
B	330KΩ	½	Not Reg.				UR354T4	Volume-Tapped ⑥ 75KΩ-rear
C	Switch		Not Reg.				U8-27	Attach to R1B
R2A	50KΩ	½	PA4456-1	QJ-431 ♦			UF54L } †	Horiz. Hold - Panel
B	1Meg	½	Not Reg.				UR16L }	Vert. Hold-Rear
R3A	25KΩ	½	PA4457-1	QJ-480 **			UF253L } ††	Contrast - Panel
B	100KΩ	½	Not Reg.				UR16L }	Brightness -Rear
R4A	2.5Meg	½	PA4454	QU-239	AG-84-8	AB-83	SU-565	Focus
B	Shaft		Not Reg.	Not Reg.	FK3-1/4	AK-1	Not Reg.	Attach to R4A
R5A	2.5Meg	½	PA4454	QU-239	AG-84-8	AB-83	SU-565	Height
B	Shaft		Not Reg.	Not Reg.	FK3-1/4	AK-1	Not Reg.	Attach to R5A
R6A	5000Ω	2	PA4411	WK-5000	A43-5000	YK-135	R5000L	Vert. Linearity-Wire wound
B	Shaft		Not Reg.	Not Reg.	FK3-1/4	Not Reg.	Not Reg.	Attach to R6A
R7A	1000Ω	2	PA4448	WK-1000	A43-1000		R1000L	Horiz. Drive-Wire wound
B	Shaft		Not Reg.	Not Reg.	FK3-1/4		Not Reg.	Attach to R7A

† Universal Replacement (Mallory exact duplicate part #UE1029)
†† Universal Replacement (Mallory exact duplicate part #UE815)
* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-123 & P2-226 (Panel), B11-137 & R1-308 (Rear)
** CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-120 & P2-226 (Panel), B11-128 & R1-308 (Rear)
♦ CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-137 & P1-229 (Panel) B18-132X & R1-312 (Rear), SWITCH 76-2.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	SPARTON PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R8	15KΩ	½		BTS-15K	
R9	47KΩ	½		BTS-47K	
R10	100KΩ	½		BTS-100K	
R11	180KΩ 5%	½		BTS-180K 5%	
R12	1500Ω	½		BTS-1500	
R13	100KΩ 5%	½		BTS-100K 5%	
R14	10KΩ	½		BTS-10K	
R15	220KΩ	½		BTS-220K	
R16	10KΩ	½		BTS-10K	
R17	15KΩ	½		BTS-15K	
R18	3.6KΩ	½		BTS-3600	
R19	1000Ω	½		BTS-1000	
R20	33KΩ	½		BTS-33K	
R21	56KΩ	½		BTS-56K	
R22	150KΩ	½		BTS-150K	
R23	47Ω	½		BTS-47	
R24	82Ω	½		BTS-82	
R25	100Ω	½		BTS-100	
R26	100Ω	½		BTS-100	
R27	4.7KΩ	½		BTS-4700	
R28	1000Ω	½		BTS-1000	
R29	100Ω	½		BTS-100	Note 2
R30	100Ω	½		BTS-100	
R31	3.3KΩ	½		BTS-3300	
R32	1000Ω	½		BTS-1000	
R33	15KΩ 5%	½		BTS-15K 5%	
R34	27KΩ	½		BTA-27K	
R35	100Ω	½		BTS-100	
R36	100Ω	½		BTS-100	
R37	4.3KΩ 5%	½		BTS-4300 5%	
R38	120Ω	½		BTS-120	
E39	100Ω	½		BTS-100	Note 3
R40	100Ω	½		BTS-100	
R41	3.9KΩ 5%	½		BTS-3900 5%	
R42	6.8KΩ	½		BTS-6800	
R43	27KΩ	½		BTS-27K	
R44	5.6KΩ 5%	½		BTS-5600 5%	
R45	220KΩ	½		BTS-220K	
R46	10KΩ	½		BTS-10K	
R47	100KΩ	½		BTS-100K	
R48	470KΩ	½		BTS-470K	
R49	3.3KΩ 5%	½		BTS-3300 5% Note 1	
R50	15KΩ	½		BTS-15K Note 8	
R51	330KΩ	½		BTS-330K	
R52	330KΩ	½		BTS-330K Note 8	
R53	2.2Meg	½		BTS-2.2Meg	
R54	47KΩ	½		BTS-47K	
R55	68KΩ	½		BTA-68K	
R56	100KΩ	½		BTS-100K	
R57	100KΩ	½		BTS-100K	
R58	82Ω	½		BTS-82	
R59	1000Ω	½		BTS-1000	
R60	470KΩ	½		BTS-470K	
R61	1000Ω	½		BTS-1000	
R62	150Ω 5%	½		BTS-150 5%	
R63	47KΩ	½		BTS-47K	
R64	10KΩ	½		BTS-10K	
R65	4.7KΩ	½		BTS-4700	
R66	4.7KΩ	½		BTS-4700	

ITEM No.	RATING OHMS	RATING WATT	SPARTON PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R67	6.8Meg	½		BTS-6.8Meg	
R68	270KΩ	½		BTS-270K	
R69	270KΩ	½		BTS-270K	
R70	470KΩ	½		BTS-470K	
R71	390Ω	1		BTA-390	
R72	1.5KΩ	10		1 3/4A-1500	
R73	12KΩ	1		BTA-12K	
R74	180KΩ	½		BTS-180K	
R75	18KΩ	½		BTS-18K	
R76	2.2Meg	½		BTS-2.2Meg	
R77	15KΩ	½		BTS-15K	
R78	8.2KΩ	½		BTS-8200	
R79	8.2KΩ	½		BTS-8200	
R80	1.1Meg 5%	½		BTS-1.1Meg 5%	
R81	6.8Meg	½		BTS-6.8Meg	
R82	100KΩ	½		BTS-100K	
R83	100KΩ	½		BTS-100K	
R84	100KΩ	½		BTS-100K	
R85	4700Ω	½		BTS-4700	
R86	2.2Meg	½		BTS-2.2Meg	
R87	390Ω	½		BTS-390	
R88	10KΩ	2		BTB-10K	
R89	10KΩ	2		BTB-10K	
R90	560Ω	1		BTS-560	
R91	560Ω	1		BTS-560	
R92	3.3KΩ	1		BTS-3300	
R93	4.7Meg	½		BTS-4.7Meg	
R94	3.9KΩ 5%	½		BTS-3900 5%	
R95	100KΩ 5%	½		BTS-100K 5%	
R96	100KΩ 5%	½		BTS-100K 5%	
R97	22KΩ	1		BTA-22K Note 3	
R98	4.7Meg	½		BTS-4.7Meg	
R99	470KΩ	½		BTA-470K	
R100	5.6KΩ	1		BTA-5600 Note 4	
R101	1.2KΩ	½		BTS-1200	
R102	100KΩ	½		BTS-100K	
R103	10KΩ	½		BTS-10K	
R104	200KΩ 5%	½		BTS-200K 5% Note 5	
R105	470KΩ	½		BTS-470K	
R106	100Ω	½		BTS-100	
R107	100Ω	½		BTS-100	
R108	270Ω	1		BTA-270 Note 6	
R109	120Ω	2		BTB-120 Note 7	
R110	39Ω	½		BTS-39	
R111	100Ω	1		BTA-100	
R112	100Ω	1		BTA-100	
R113	33KΩ	2		BTB-33K	
R114	39KΩ	2		BTB-39K	
R115	10KΩ	2		BTB-10K	
R116	5.1Ω	½			
R117	1Meg	1		BTA-1Meg	
R118	1.5KΩ	1		BTS-1500	
R119	1000Ω	½		BTS-1000	
R120	8.2KΩ	2		BTB-8200	
R121	8.2KΩ	2		BTB-8200	
R122	470KΩ	½		BTS-470K Note 8	
R123	4.7Meg	½		BTS-4.7Meg	

Note 1. Some Models may use a 2200Ω resistor in this application.
Note 2. Ch. 25D173A may use a 1000Ω resistor in this application.
Note 3. Ch. 25D173A may use a 12KΩ resistor in this application.
Note 4. Ch. 25D173A may use a 4700Ω resistor in this application.
Note 5. Ch. 25D173A may use a 180KΩ resistor in this application.
Note 6. Ch. 25D173A may use a 150Ω resistor in this application.
Note 7. Ch. 25D173A may use a 300Ω resistor in this application.
Note 8. Not used in all Models.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
					REPLACEMENT DATA					
T1	117VAC @2.06A	660VCT @.200ADC	316VCT @.108ADC	5VAC @3A	AB4030-1					
		SEC.4	SEC. 5	SEC. 6						
		5VAC @3A	6.3VAC @2.4A	6.3VAC @10A						

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC	SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
			REPLACEMENT DATA						
T2	150Ω	820Ω	AB47006-4	A-8111	A-3000	TSO-5Ⓙ	A-97KⓁ		Vert. Osc.Trans.
T3	280Ω tap @30Ω	4.8Ktap @4.1Ω	PC70012F PC70015 Ⓘ		RVO-10Ⓚ Ⓚ	TFB-8Ⓚ Ⓚ			Horiz.Output Trans.
		SEC.2							
		3.2Ω							
		SEC.3							
		0Ω							
T4	700Ω	7Ω	AB44062-7	A-8115	A-3035	TSO-1	A-101U		Vert.Output Trans.
T5A	12Ω		PC70018A	DY-8A Ⓜ	MDF-70 Ⓜ	TY-2 Ⓜ	Y-12 Ⓜ		Horiz. Deflection Coils
B	64Ω								Vert.Deflection Coils
T6	6.5Ω		AA6400-3 AA6400-4 Ⓝ		MWC-2Ⓝ	TW-5	WC-12Ⓝ		Horiz. Linearity Coil

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
			REPLACEMENT DATA						
T7	6.5Ω		AA6400-3		MWC-2Ⓝ	TW-5	WC-12Ⓝ		Width Coil
			AA6400-5Ⓝ						

① Drill one new mounting hole.
② Drill new mounting holes.
③ Connect original terminal #8 to new terminal #1, original terminals #1 and #2 to new terminal #4, original #3 to new #7, original #4 to new #8, original #5 to new #9. Remove or short R116 and R117 and connect width coil across terminals #6 and #7.
④ Mount on side of high voltage cage.
⑤ Connect original terminal #6 to new terminal #1, original terminals #1 and 3 to new terminal #4, original #3 to new #6, original #4 to new #9, original #5 to new #7.
⑥ Connect original terminal #6 to new terminal #1, original terminals #1 and #2 to new terminal #7, original #3 to new #6, original #4 to new #9, original #5 to new #8.
⑦ Use original horizontal deflection coil network if necessary.
⑧ Use original deflection coil network.
⑨ Enlarge mounting hole.
⑩ Connected to coded blue and green terminals.
⑪ Used in Ch. 25D173A

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
				REPLACEMENT DATA					
T8	6.4KΩ	3.6Ω	261Ω	.32Ω	AB44055-3	A-3823	A-3020	RO-13 ①	S-92	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	SPARTON PART No.	JENSEN PART No.	QUAM PART No.	NOTES
				REPLACEMENT DATA			
SP1	6"	PM	3.6Ω	PC-63000-43	ST-108 Mod. P6-X	6A1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	SPARTON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
				REPLACEMENT DATA				
L1	Ant. Coils	0Ω CT	0Ω					
L2	Fil. Choke	0Ω						
L3	Neutr.Coil	0Ω						
L4	RF Mixer Grid & Osc. Coils	0Ω						
L5	Fil.Choke	0Ω						
L6	RF Choke	0Ω						
L7	1st.Video IF	1Ω						
L8	RF Choke	1.2Ω						
L9	Associated Sound Trap	0Ω		AB43523-12	19-1020	TV-12	6171	
L10	Fil. Choke	.1Ω		AA6651-1	19-3001	TV-189	4608	2 Microhenries
L11	Adj.Channel Sound Trap	0Ω		AB43523-13	20-1006		6171A	
L12	2nd.Video IF	.1Ω		AA6408-1	17-1003	TV-102	6188	
L13	Fil.Choke	.1Ω		AA6651-1	19-3001	TV-189	4608	2 Microhenries
L14	2nd.Video IF	.1Ω		AA6408-1	17-1004	TV-102	6189	
L15	Fil.Choke	.1Ω		AA6651-1	19-3001	TV-189	4608	2 Microhenries
L16	4th.Video IF	.1Ω		AA6408-1	17-1004	TV-103	6189	
L17	RF Choke	2.8Ω		AA6650-1			4626	25 Microhenries
L18	Fil. Choke	.1Ω		AA6651-1	19-3001	TV-189	4608	2 Microhenries
L19	5th.Video IF	.5Ω		AA6364-1	17-1001 †	TV-100 †	6186 †	
L20	RF Choke	2.8Ω		AA6650-1			4626	25 Microhenries
L21	Fil. Choke	.1Ω		AA6651-1	19-3001	TV-189	4608	2 Microhenries
L22	Series Peaking Coil	8.5Ω		AA6402-6	19-3180 ▲		4644 ▲	146 Microhenries, wound on 4.7KΩ resistor
L23	Shunt Peaking Coil	19Ω		AA6613-8	19-3660	TV-188	4650	600 Microhenries
L24	Series Peaking Coil	20Ω		AA6402-7	19-4200	TV-184 ♦	4646 ♦	213 Microhenries, wound on 6.8KΩ resistor
L25	4.5MC Trap	1.8Ω		AA6407-1	20-1004	TV-151	1470	
L26	Shunt Peaking Coil	15Ω		AA6613-10	19-1923	TV-188	4666	430 Microhenries
L27	1st.Sound IF	1.7Ω		AA6364-2	17-1031			
L28	2nd.Sound IF	2.3Ω	2.2Ω	AA6667-5	17-1032 *	TV-106 *	1466 *	
L29	Ratio Det.	4.8Ω	1.15CT	AA6684-4	17-3480 ■	TV-115 ■	6205 ■	Tertiary winding-.8Ω
L30	Horiz.Osc.	6Ω		AA6410-1	19-1576	TV-163	6210	
L31	RF Choke ♦	.5Ω					4606	4.5 Microhenries

* Drill new mounting holes.
† Retune Trap.
▲ Parallel with 4.7KΩ resistor
♦ Parallel with 6.8KΩ resistor
■ Use adaptor plate and disconnect C66.
▲ Disconnect C66.
♦ Not used in all Models.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
				REPLACEMENT DATA				
L32	.108ADC	108Ω	3 Hy.	AB47009-1			C-2994	TR-3300 ①
L33	.200ADC	108Ω	3 Hy.	AB47009-1			C-2994	TR-3300 ①

① Drill one new mounting hole.

SPARTON MODELS 5325, A, 5326, A, 5362, A, 5363, A (Ch. 25D173A, 27D173)

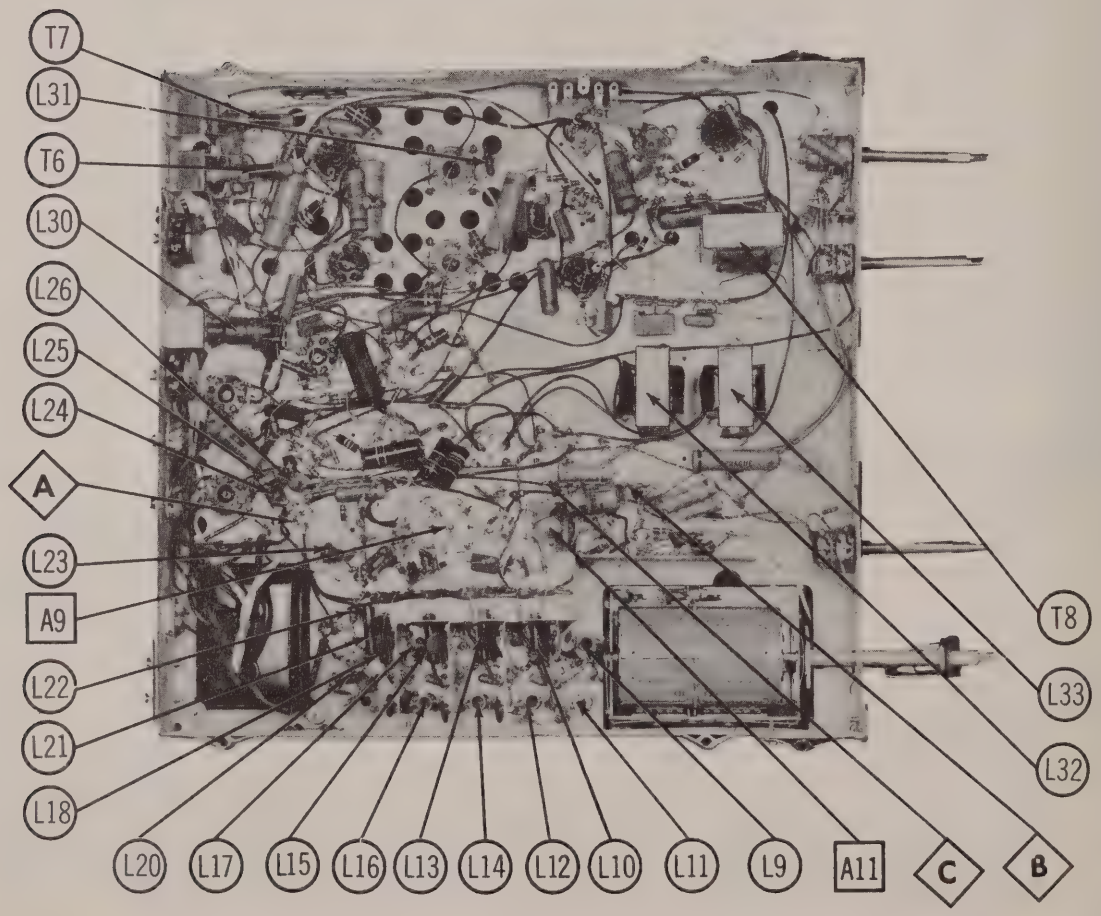
PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SPARTON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3/8A 250V			318.375 (3/8A-3AG P/T)		GJV 3/8	

MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M2	Dial Light		Type #47
M3	RF Tuner	PD93158	
M4	Centering Magnet		Complete with centering arms
M5	Ion Trap	PA1248-4	
	Knob, Inner	PA5659-1	Models 5325, 5362 (Horiz. Hold and Contrast)
	Knob, Inner	PA5659-2	Models 5326, 5363 (Horiz. Hold and contrast)
	Knob, Outer	PA5660-1	Models 5325, 5362 (Vert. Hold and brightness)
	Knob, Outer	PA5660-2	Models 5326, 5363 (Vert. Hold and brightness)
	Knob	PB40364-1	Models 5325, 5362 (Tone Control)
	Knob	PB40364-2	Models 5326, 5363 (Tone Control)
	Knob	PB40363-1	Models 5325, 5362 (Fine Tuning)
	Knob	PB40363-2	Models 5326, 5363 (Fine Tuning)
	Knob	AB43593-1	Model 5325, 5362 (Channel Selector)
	Knob	AB43593-2	Models 5326, 5363 (Channel Selector)
	Knob	AB43594-1	Models 5325, 5362 (Off/On/Volume)
	Knob	AB43594-2	Models 5326, 5363 (Off/On/Volume)
	Mask	PD93035-3	Models 5362, 5363
	Mask	PD93035-4	Models 5325, 5326
	Safety Glass	PD93046-1	Models 5325, 5326
	Safety Glass	PD93045-1	Models 5362, 5363
	Safety Screen	PB40209-8	Models 5325, 5326



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

TROUBLE SHOOTING AIDS (cont)

PROP.
L. F. BLA.
3924 MEADE ST.
DENVER, COLORADO

AUDIO

WEAK OR NO SOUND

Check by substitution V10, V11, V12, V13 and V14. Check stages of V13 and V14 by shorting, momentarily, pin #1 of V13 to chassis. A loud noise should result.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V13 and V14.

BUZZ

Check adjustments A11 and A12. Adjust for minimum buzz. If buzz is still objectionable substitute V12 and readjust A12. Check C6, C67 and other associated components.

DISTORTED

Check by substitution V10, V11, V12, V13, and V14. Check stages of V13 and V14 using an audio signal generator and scope. Apply audio signal across R67. Connect scope across primary of T8.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check component associated with V13 and V14.

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1. If filaments light, check V25 and V26. Check both power supply filter and decoupling network components.

SMALL AND/OR DIM RASTER

Check V25 and V26. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M1. Check by subsitution V19, V20, V21, V22, V23 and V24. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check C105, R116, R117, T3 T5A and other associated components.	Check C94, C95, C96, C93, R104, R115 and other associated components

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, V21, V22, V23 V24, and V26. Check adjustment of horizontal drive, B2 and B3. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V24, V26, V23, V22, V21, V20, and V19. Check C105, R116, R117, T3, T5A and other associated components. Check picture tube.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX

Check by substitution V1, V2, V3, V4, V5, V6 and V7. Check associated circuit components. Check V25 and associated components.

NO RASTER NO SOUND

See "Dead Set".

TOTAL LOSS OF SYNC

Substitute V15 and V16. Check components associated with V16A and V15 especially coupling capacitors and plate load resistors.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft.

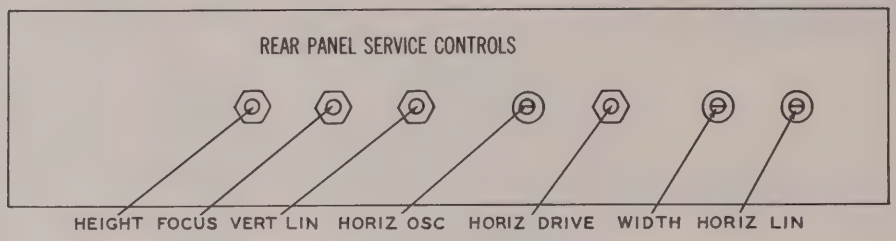
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety Glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. Set the Horiz. Hold Control at the Mid-position of its range and adjust the Horiz. Osc. slug (L30) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary (L29) located on top of chassis. (See tube placement chart.)

FUSES

One fuse is used for Horiz. Sweep Circuit protection. (For location, see tube placement chart.)

CENTERING

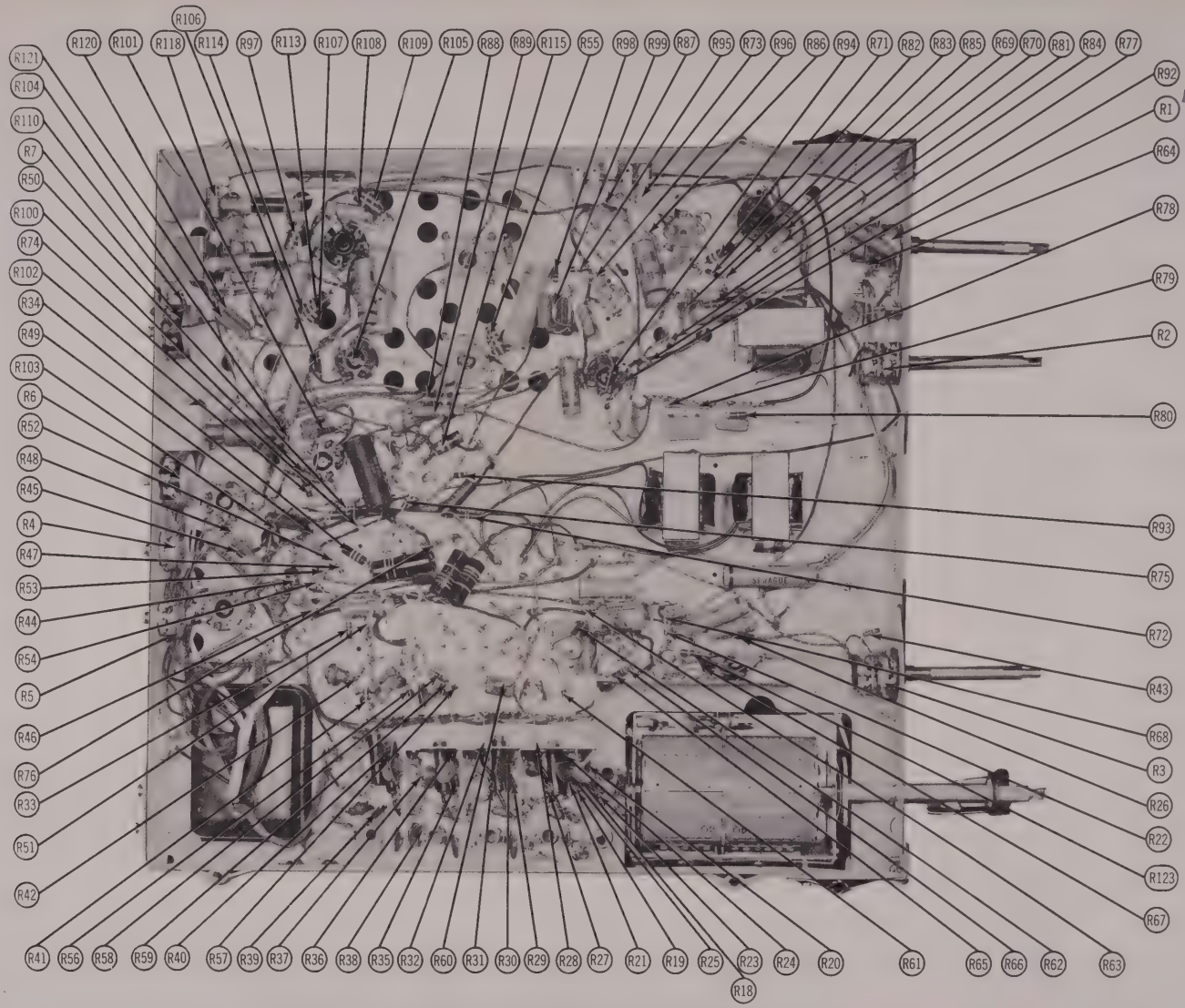
Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

ANTI-PIN CUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible, and position the magnets so that all sides are straight lines and the corners are at right angles.

DISASSEMBLY INSTRUCTIONS

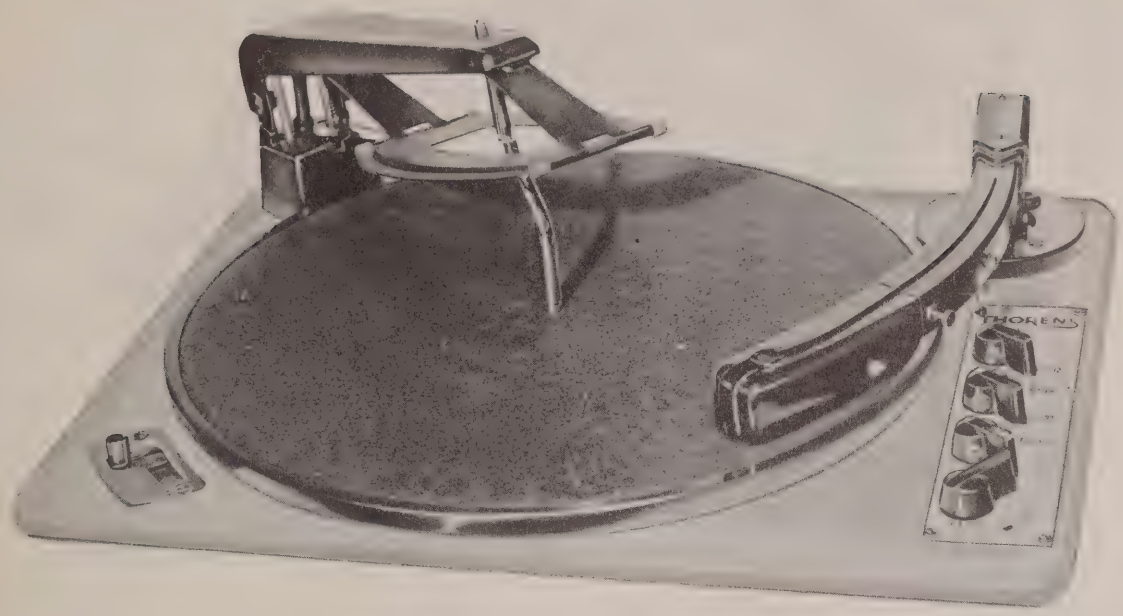
1. Remove 8 push on type control knobs from front panel.
2. Remove 6 wood and 1 metal screws. Remove rear cover.
3. Disconnect built-in antenna and speaker.
4. Remove 2 speaker nuts. Remove speaker.
5. Remove 4 chassis bolts. Remove chassis.



FROM
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

THORENS
MODEL CD43



THORENS
MODEL CD43

Figure 1

GENERAL INFORMATION

The Thorens Model "Concert" CD-43 is designed to play standard 78 RPM fine-groove 45 RPM, or micro-groove 33 1/3 RPM records of standard commercial dimensions. Records up to 12" in diameter can be played.

Features of this changer include playing and automatically changing up to a 1" stack of records at any speed or about ten 10" or 12" records mixed in any order.

A full stack of twelve 7", 33 1/3 RPM records or a full stack of twelve 7", 45 RPM records (with the use of an adaptor) will also play on this changer.

The Thorens automatically shuts off after the last record has been played and the tone arm is returned to its rest position.

The motor used in this changer can be adapted to the following voltages:

100-120
125-150 Volts AC 50 to 60 cycles.
200-250

Manufactured by:
Thorens
Ste. Croix, Switzerland

Distributed in U.S. by:
Thorens Company
New Hyde Park, Long Island, N. Y.

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA

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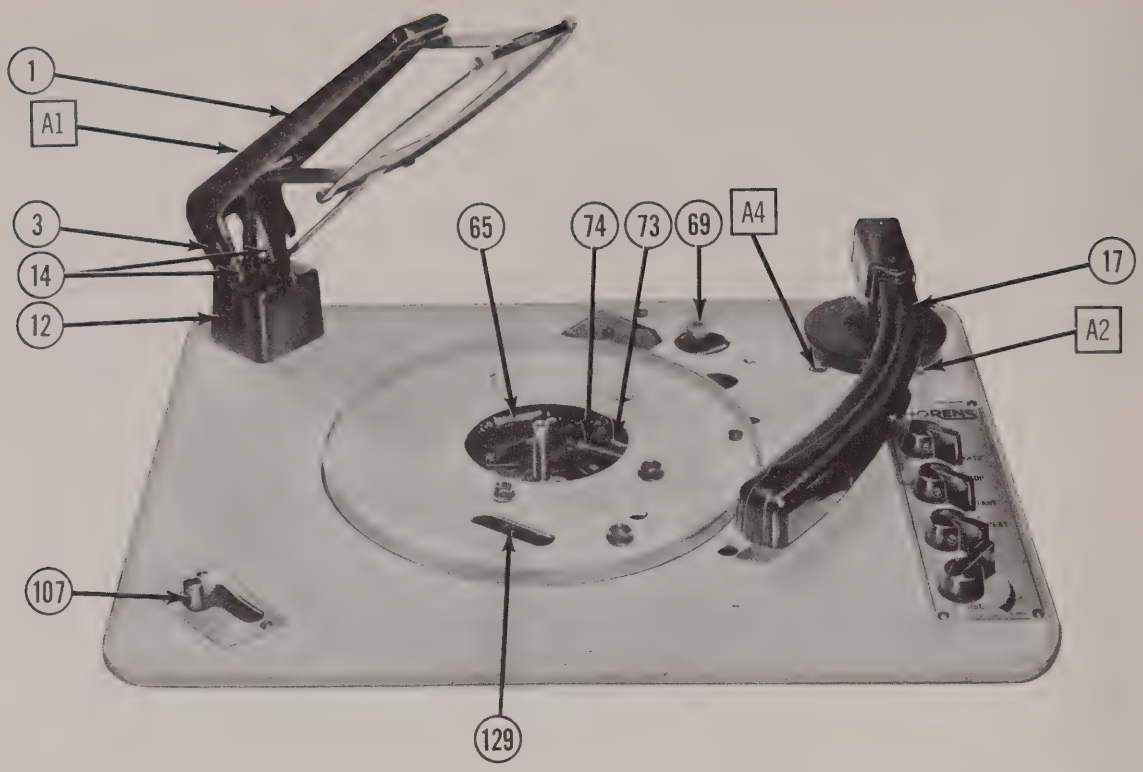

Figure 2

OPERATING INSTRUCTIONS

1. Raise the overarm (1) to its most upward position.

2. Place the spindle (6) in the center of the turntable, the sloping part leaning toward the overarm platform (12), and place the records to be played on the spindle.

3. Lower the overarm, the hole in the free end then holds the spindle in position. Make sure that the overarm is completely lowered on the spindle.

4. Place the knob of the speed selector (107) to the speed corresponding to the type records to be played and verify that the proper needle is used.

NOTE: Standard, fine-groove, and long-play records cannot be intermixed. The motor speed control knob must be reset for each type record.

5. Place the set-down position knob in the position suited to the records being played, either 7" or 10" - 12".

To Play Standard (78 RPM) Records-

1. The motor speed control knob must be in the "78" position.

2. Turn the stop control knob to start. The changer will now play the entire stack of records and on completion of the last record the tone arm will return to its rest position and the changer will automatically stop.

To Play Fine-Groove (45 RPM) Records-

1. The motor speed control knob must be in the "45" position.

2. Most 45 RPM records are manufactured with a 1 1/2" spindle hole. It is essential that an adaptor be used with all large hole records.

To Play Long-Play (33 1/3 RPM) Records-

1. The motor speed control knob must be in the "33" position.

Rejecting-

To reject a record at any time while changer is operating, turn reject-pause control knob to "Reject" and release.

To Pause Between Records-

A pause of 5 minutes maximum duration at 78 RPM can be introduced between two records by placing the reject-pause knob on the desired position. The changer will maintain the pause between records until the control knob is turned away from the "Pause" position. The change cycle may be resumed any time during the pause by turning the control knob away from the "Pause" position.

To Repeat a Record-

Any record may be repeated by turning the repeat control knob to the "Repeat" position. After the record has been repeated, the changer is automatically tripped, starting a new change cycle which drops the next record, unless the record that is repeated is the

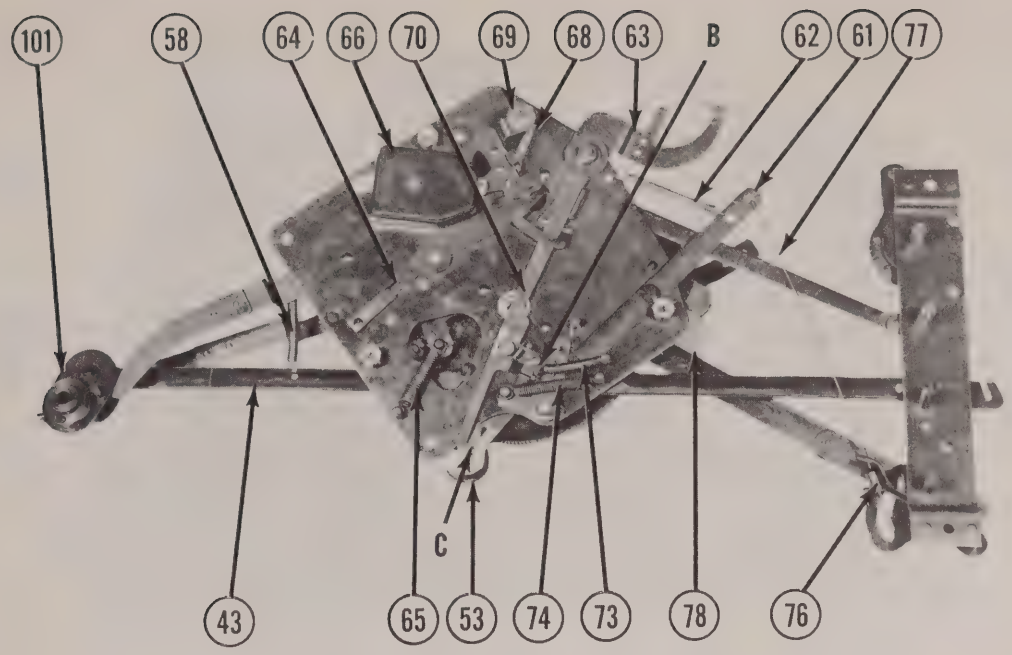

Figure 3

last record, in which case the changer will automatically shut off.

Stopping-

The changer can be stopped at any time by turning the stop-start control knob to position "Stop". It will start again if the knob is placed on position "Start", resuming playing at the place where it was interrupted.

CAUTION: The movements of the tone arm are controlled by the changer mechanism. The tone arm should therefore never on any account be forced into position by hand. The overarm should not be raised from the spindle while playing to avoid risk of damaging the records.

CHANGE CYCLE

It is recommended that the change cycle operation be observed by rotating the turntable by hand. The action described below can then be readily followed and the function of each part more easily understood.

A three-speed, governor controlled, 4-pole motor is used to drive the changer mechanism. Power is transmitted to the turntable directly by the motor shaft. The turntable speed is determined by the position of speed adjustment lever (107).

As the tone arm moves into the eccentric groove of a record, the stud (A) of the tone arm control lever (21) moves against the trip lever actuating fork (63), which in turn, carries the trip lever (70) in toward the turntable hub. Trip lever (70) is fed inwards by the friction provided by its own weight resting on the trip lever actuating fork (63). As the trip lever (70) moves inward it latches at point (B) (Fig. 3) with the clutch stop lever. The drive gear striker pad (126), turning with drive gear (128), strikes the trip lever (70) at point (C) (Fig. 3) causing the trip lever to move away from the turntable hub. Since the trip lever (70) and the clutch stop lever are latched together, the outward travel of trip lever (70) disengages the clutch lever from the clutch plate. The tension of the clutch plate spring (74) moves the clutch plate in to permit the clutch pinion gear (53) to mesh with drive gear (128) and start the change cycle.

The clutch pinion (53) now turns the pause gear (83) which, in turn, rotates any time the changer mechanism is in any phase of the change cycle. The pause gear is coupled to the main gear (82) by means of a spring loaded stud which is rivited on top of main gear (82). Thus, the pause gear (83) drives the main gear (82) throughout the change cycle.

The main gear (82) is fastened to the shaft of the main cam (91); therefore, the main cam turns with the main drive gear.

As the cam turns, the finger of the cam lever (92) rides up the groove of the cam. This causes the lift bracket (96) to be pivoted upward, thus raising the tone arm off the record. The main cam (91) is so shaped that when the finger of the cam lever (92) rides around the groove in the top of the cam, the cam lever is pivoted; this moves the tone arm actuating lever (97) out which, in turn, moves the tone arm out clear of the records.

The roller nearest the hub on top of main gear (82) comes in contact with the cam that is mounted on the ejector lever (43), thus actuating the ejector lever causing it to turn the ejector lever crank (101) and record selector shaft (10). The selector shaft is fastened to the ejector lever crank by the set screws (100). As the selector shaft and roller (8) turn, it pulls the push lever actuating link, located in the overarm (1), against the push lever (5) dropping a record to the turntable.

At the same time the ejector lever crank (101) turns, the stud (D) of this crank turns the selector crank (104). When a 12" record is to be dropped to the turntable, the weight of the record on the selecting feeler pivots the feeler against the selector latch (115). Therefore, the selector latch is moved against the selector crank cam (104). As the selector cam re-

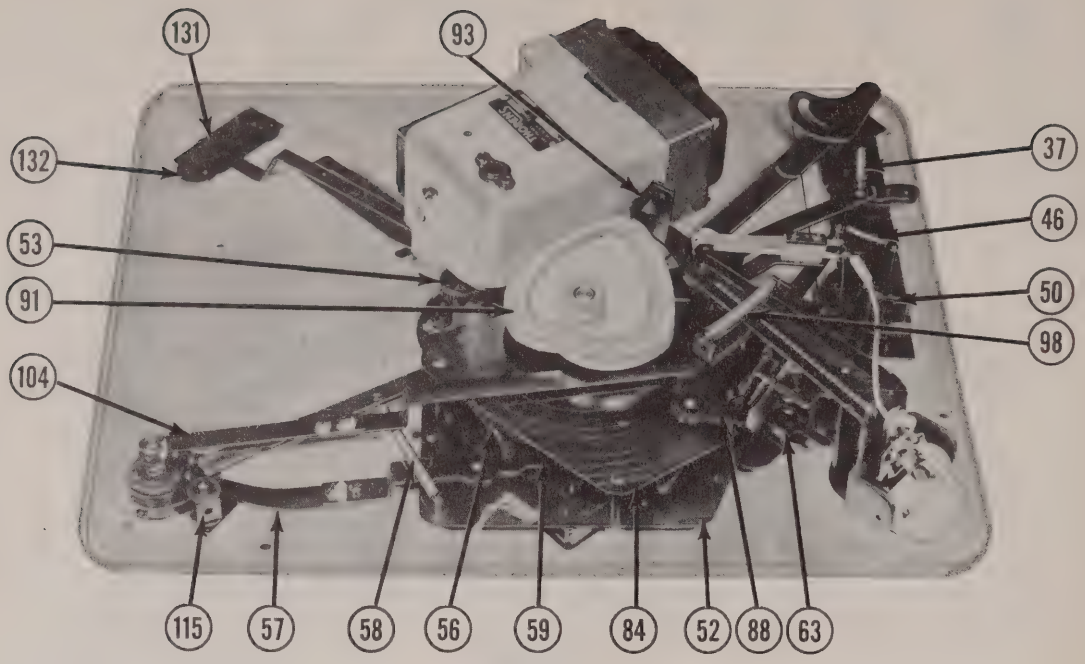

Figure 4

verses in motion, it is stopped by the selector latch making contact with the step (E) of the selector crank (104), thus setting the landing position cam (88) for 12" set down.

When a 10" record is to be dropped to the turntable, the diameter of the 10" record isn't great enough to allow the edge of the record to contact the selecting feeler (16); therefore, the selecting feeler stays in a raised position and the selector latch (115) will not engage with step (E) of selector crank (104). This action permits step (E) of selector crank (104) to move past selector latch (115), thus setting the landing position cam (88) for 10" set down.

When a 7" record is dropped to the turntable, the set-down action is the same as for 10" records except that the 7", 10" and 12" set-down control knob is placed in the 7" position. When in this position, the stud of the set-down positioning cam (47) becomes entirely disengaged from the 7" abutment lever (95). This action permits the 7" abutment lever (95) to be moved against the stud of set-down adjusting screw (22) by force exerted by the 7" abutment lever spring (94). Therefore, the tone arm is carried in for 7" set-down by the 7" abutment lever.

The action of main cam (91) moves the tone arm actuating lever (97) in to contact the landing position cam (88). As the actuating lever moves in, it contacts the stud of the set-down adjusting screw (22), thus moving the tone arm in for set down.

For 7" and 10" records, the finger of the tone arm actuating lever will contact the landing position cam (88) at point (G), and for 12" records, it will contact the landing position cam at point (F).

The cam lever (92) now rides down the incline of main cam (91), lowering the tone arm to the record.

At this time, the roller located nearest the hub on top of main drive gear (82) contacts the clutch actuator lever (55). This action latches the clutch plate so as to disengage the clutch pinion (53) from the drive gear (128), thus completing the change cycle.

PAUSE ACTION

When the control knob is placed in the "Pause" position, the pause lever (78) moves in between main drive gear (82) and pause gear (83). As the changer starts its next cycle, both gears (82) and (83) are turned by clutch pinion (53) until the spring loaded stud, located on main drive gear (82), comes in contact with the pause lever (78). When this takes place, the stud of the main drive gear rides up on top of pause lever (78) thus, disengaging the stud from the pause gear (83). Since the main drive gear is driven by the pause gear thru this stud, the rotation of the main gear stops, although the pause gear continues to turn. The main cam (91) which is fastened to the main gear (82) also stops. The finger on the bottom of the pause gear strikes the star wheel (79) on every revolution of the pause gear. The star wheel turns the pinion gear (79) which turns the main gear (82) a definite amount. This continues until the stud of the main gear has been moved far enough to ride off of the top of pause lever (78). When this happens, the stud of the main gear engages with the pause gear again, thus continuing the change cycle.

A pause of 5 minutes maximum duration at 78 RPM can be introduced between two records. The duration of the pause is determined by the width of the pause lever (78) at the point where the stud of main gear (82) rides. When the control knob is in the 1 minute pause position the stud of the main drive gear rides across the narrow tip of the pause lever (78) whereas, when in the 5 minute position the stud rides across the widest part of the pause lever.

REPEAT ACTION

When the control knob is turned to the "Repeat" position, the repeat control crank (41) moves the record ejector lever (43) out a definite amount so that the

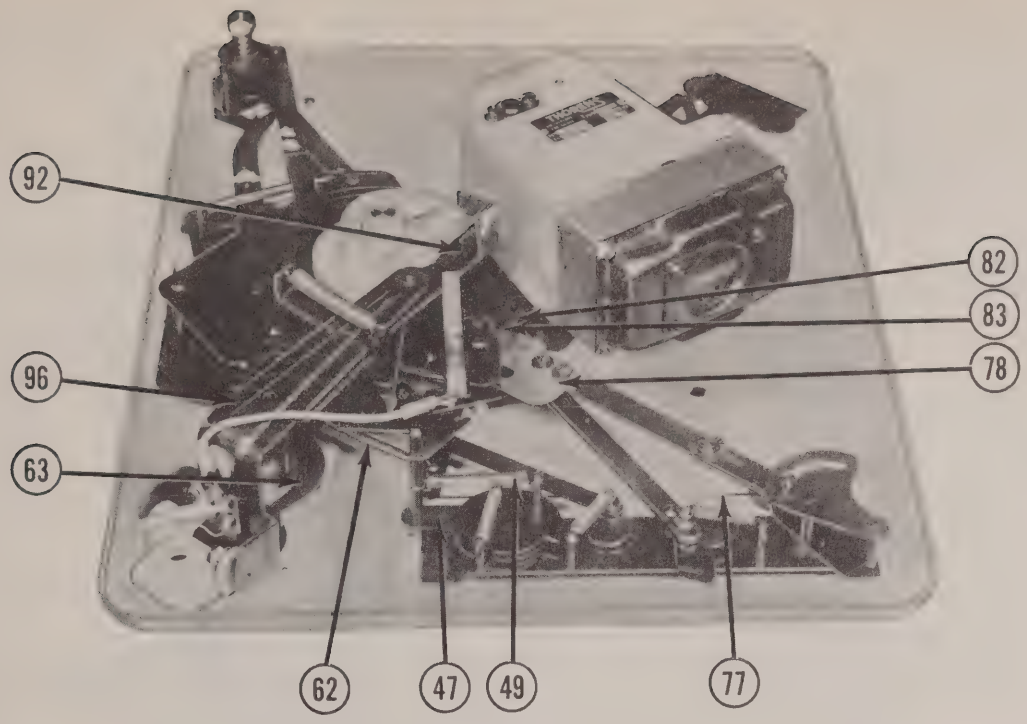

Figure 5

roller nearest the hub on top of main drive gear (82) will not contact the cam on ejector lever (43). This action prevents the record dropping mechanism from being actuated and, consequently, the tone arm moves in and sets down again on the record that just completed playing. As the tone arm is being lowered to the record, the roller farthest away from the hub on main gear (82) moves against the back of the cam on the ejector lever (43). This moves the control knob off "Pause" position, thus returning the ejector lever to its normal position.

ADJUSTMENTS

Tone Arm Height-

The tone arm is adjusted so that when the arm is lowered the needle of the tone arm will be level with the velvet of the turntable. To adjust the height of the tone arm, bend the height adjustment bracket (20) at point (A3). The tone arm should be raised for access to this bracket.

Tone Arm Landing Position-

The landing position of the tone arm should be approximately 1/8" in from the edge of a record. Turn the reject control knob to "Reject". Turn the turntable, by hand, and note where the needle first touches the record. The point at which the needle drops on the record may be adjusted by screw (22). This screw can be reached through hole (A4) (Fig. 2) with the tone arm resting on a 10" record.

Record Feeding Mechanism-

If a record does not drop from the spindle step, or drops late, examine first of all if the center of the record is of standard thickness and not worn. Also check to see if spindle is clean. If the defect is not caused by this, remove the records, start the changer and then stop it just at the moment when the push lever (5) is out at its maximum point. Then verify that push lever (5) is in line with the spindle body at the spindle step. If push lever (5) is out of adjustment, adjust by turning screw (A1) in the proper direction.

Tone Arm Pressure Adjustment-

The tone arm pressure should be adjusted to the cartridge manufacturers specifications. Adjustment may be made by loosening screw (A2) and pivoting the tone arm pressure spring mounting lug to increase or decrease the tension on the tone arm pressure spring (18), as required.

Turntable Brake-

The turntable brake is connected to the switch bracket (69). If the brake pad becomes worn, it will allow the turntable to overrun resulting in the motor not starting at the beginning of a new stack of records. This can be rectified by slightly turning the leather pad to present a new surface to the turntable rim.

LUBRICATION

Motor and Cycling Mechanism-

The motor and cycling mechanism needs lubricating from time to time, generally after 500 hours use. To do this, remove the turntable and introduce a few drops of good quality thin oil (SAE 20) into the lubricating holes (colored red). Do not use a consistent oil which might retard the motor and cycling mechanism. After a few years use it is advisable to replace the hardened grease of the cams, gears and other rubbing surfaces with fresh clean grease.

Record Spindle-

It is essential that the record spindle fit perfectly free in the hole of the turntable spindle when the overarm (1) is in playing position. This hole should be kept clean.

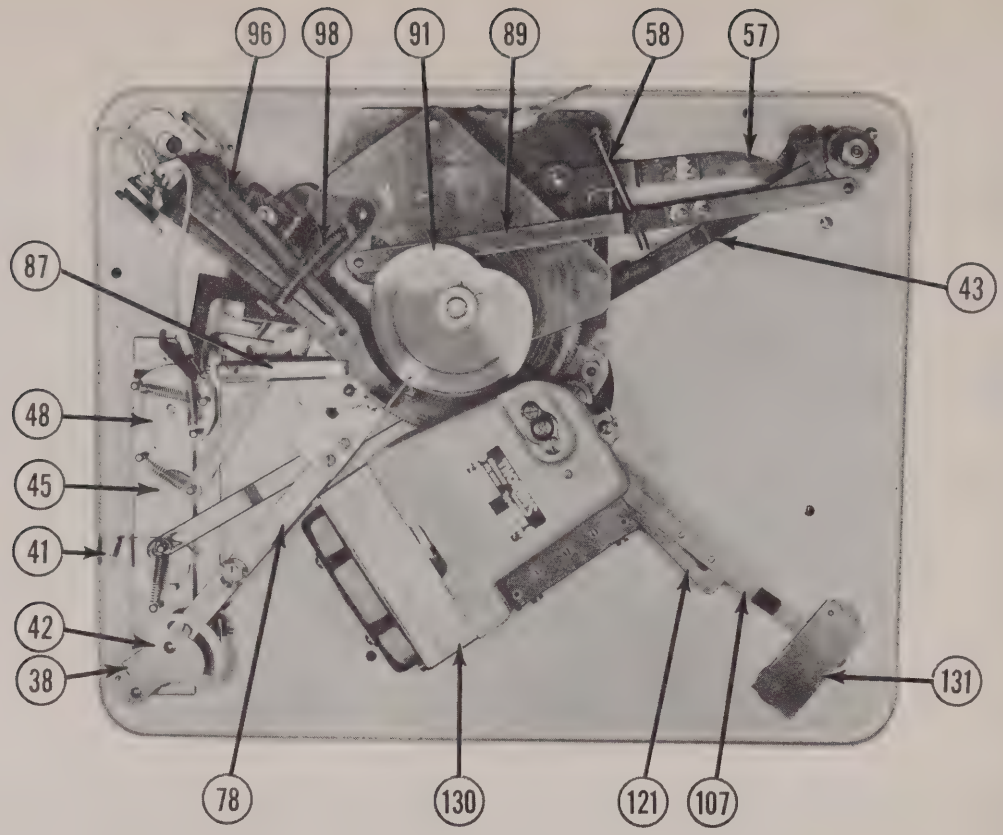

Figure 6

Apart from cleaning push lever (5) periodically, it is advisable when oiling the motor to introduce a drop of thin oil into the hole of the turntable spindle where the record spindle pivots.

CAUTION: Do not, under any circumstances, allow any oil or grease to come in contact with the following parts:

1. Stop feeler (15).
2. Selecting feeler (16).
3. Between trip lever actuating fork (63) and trip lever (70).

TROUBLE CHART

SYMPTON	CAUSE	REMEDY
Turntable and Motor		
I. Turntable does not revolve when control is set to "START". Remark: Hold control for one or two seconds in the "START" position. Caution: Do not force turntable to revolve when stuck.	(1) No current at motor.	(a) Check that current is reaching AC leads of changer. (b) Remove turntable and check if voltage adjusting screw (129) is tight and set for correct line voltage. For 110-115 Volts 60 cycles power supply, screw (129) must be in the 125-150 V position. (c) Open power switch cover (66) and check contact adjustment. Replace broken contact springs (part # A130).
	(2) Unlubricated motor.	See instructions for correct motor lubrication.
	(3) Motor defective.	(a) Withdraw motor from changer by untightening three nuts (28) and screws (33) of speed control escutcheon (34). (b) Open motor top cover and check fibre gear. If worn, replace the whole assembly, part #ME150.

TROUBLE CHART - Con't.

SYMPTOM	CAUSE	REMEDY
		(c) Withdraw speed change gears and check that rotor shaft revolves freely. If stuck, withdraw motor end cover and loosen the two screws of speed governor to take out the rotor. (Do not untighten the four stator screws).
		(d) If no mechanical defect is to be found, check commutator wiring and field coils.
II. Incorrect turntable speed.	(1) Incorrect setting of voltage adjusting screw (129).	See § I l b .
	(2) Speed selector out of adjustment.	(a) Two circular cams (132), eccentrically mounted on screws (33), determine the end positions of the speed selector. For the normal adjustment of those cams, the exact speed, 33 1/3, 45, 78 RPM, is reached when the knob is in contact with the proper abutment. To displace these cams, slightly loosen the two screws (33) using a stroboscope to determine the proper speed. Tightening the screws will fix the cams.
III. Irregularities in turntable speed.		
Flutter	Spring coupling on turntable shaft tight or broken.	(a) Withdraw motor from changer by untightening the three nuts (28) and screw (33) of speed selector.
		(b) Open motor top cover and check spring coupling. If broken replace with part # MR613.
Wows and Waves	(1) Defective record.	Warped records may slip on one another. Enlarged center holes can also cause wows.
	(2) Record spindle unlubricated.	Remove record spindle and put a drop of thin mineral oil into center hole of turntable spindle.
	(3) Center hole in turntable spindle clogged by accumulation of dirt.	Record spindle must fit into center hole of turntable spindle. If spindle binds clean thoroughly center hole with a hardened steel point until thrust ball is entirely freed.
	(4) Record spindle bent.	Record spindle should fit perfectly free in center hole of turntable spindle when the overarm is in playing position.
		Raise overarm and bend record spindle in the proper direction very carefully.
	(5) Unlubricated motor.	See instructions for correct motor lubrication.
	(6) Foreign matter in motor gear.	Withdraw and open motor and carefully clean gears and their shafts with Naphta. Lubricate before reassembling.
	(7) Fibre gear defective.	Check each tooth of fibre gear and, if defective, replace the whole assembly, part # ME150.
	(8) Turntable shaft bent.	When forwarding, turntable must be removed from its shaft and packed separately, otherwise bending of the shaft may occur.
IV. Noise during playing of record. Noise ceases when pickup is lifted from record.	(1) Motor rumble.	
	Frequency between 100 and 200 cycles.	(a) Exagerated bass boost on the amplifier. Adjust bass control for a natural reproduction.

A PHOTOFACT "EXPLODED" VIEW
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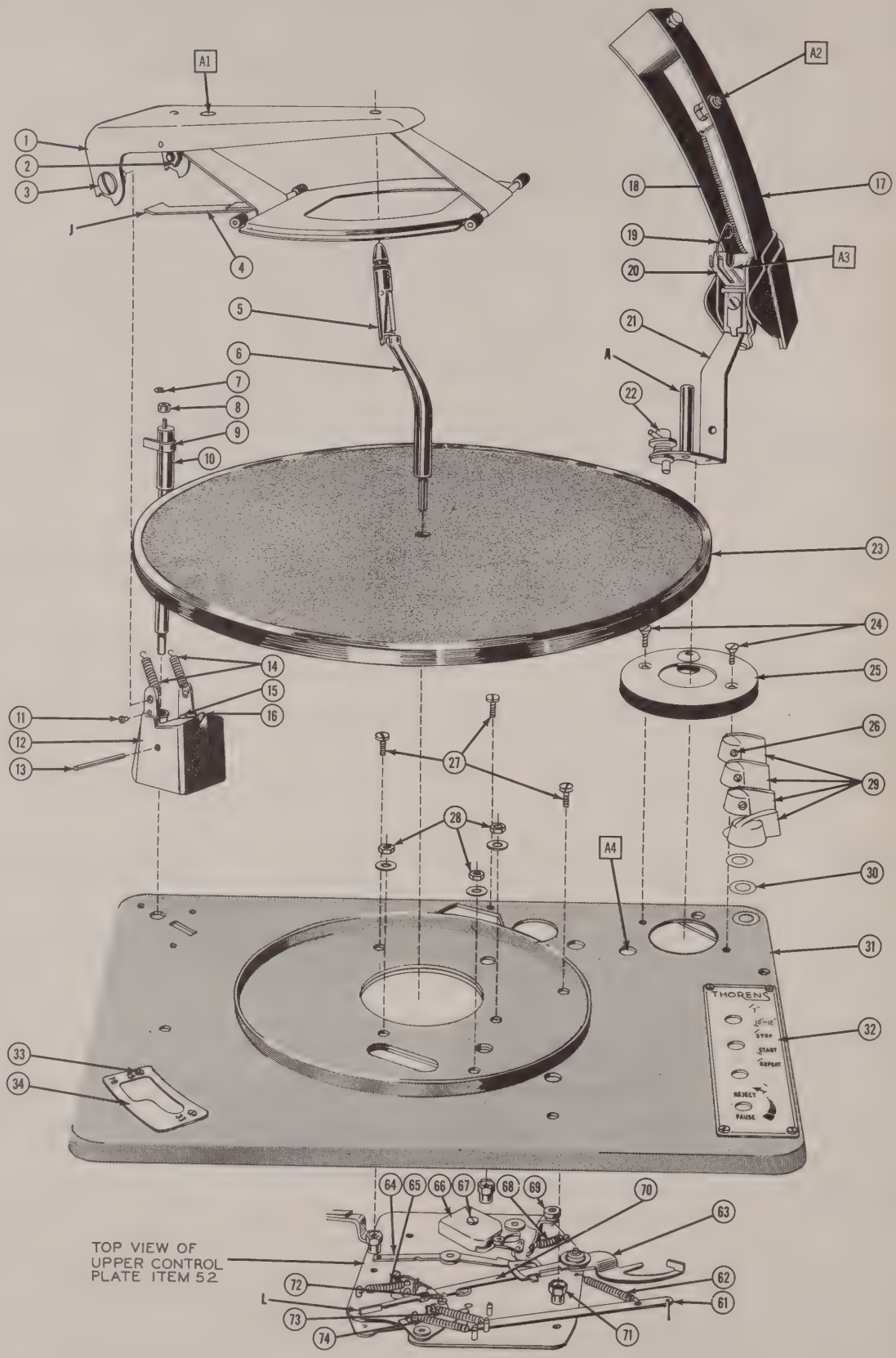
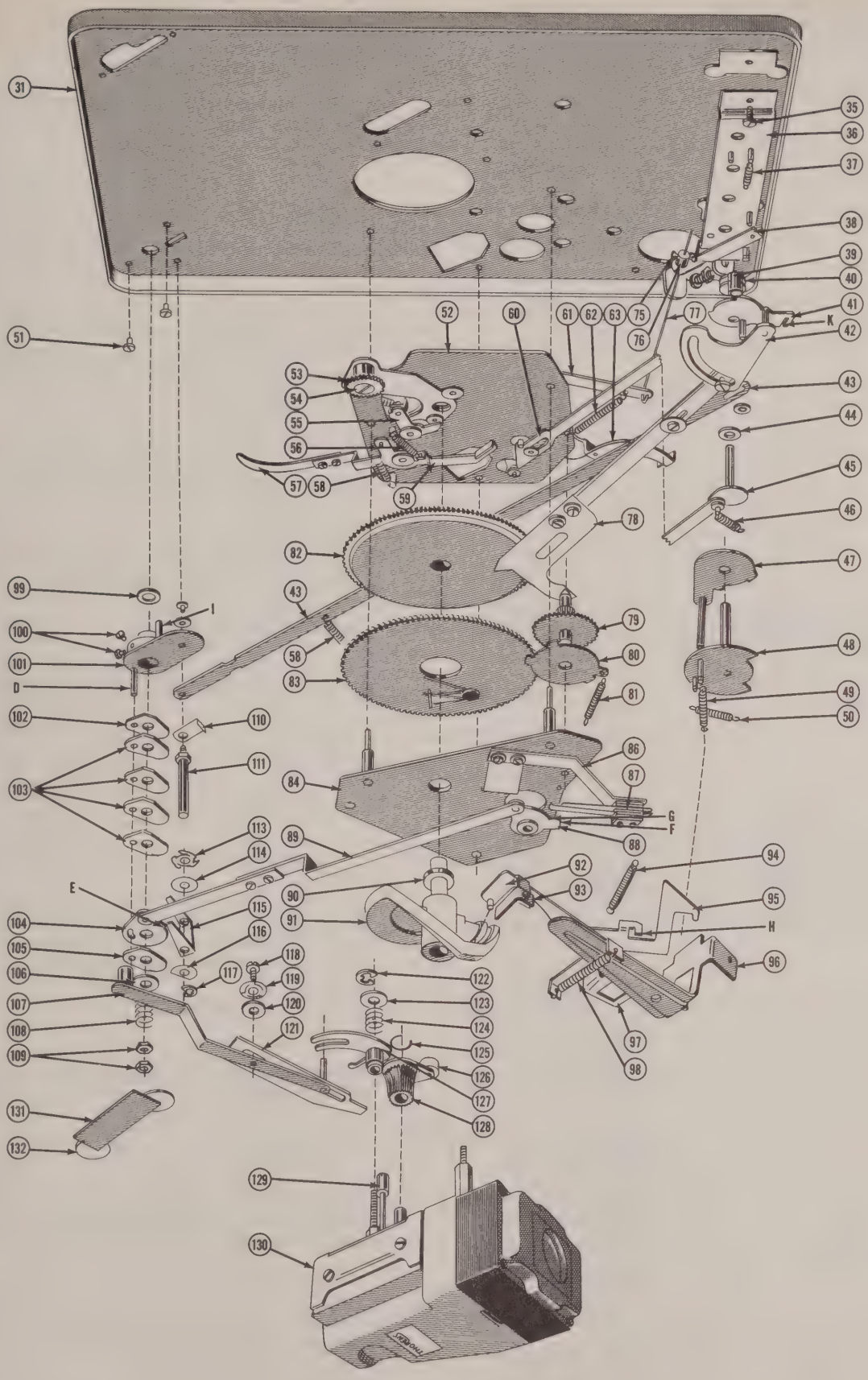


Figure 7A. Exploded View Of Parts Above Baseplate.



A PHOTOFACT "EXPLODED" VIEW
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Figure 7B. Exploded View Of Parts Below Baseplate.

SYMPTOM	CAUSE	REMEDY
		(b) Check spring suspension of record changer according to furnished template.
		(c) Uncentered rotor through shock on stator. Change the motor.
	(2) Motor rumble.	
	Frequency under 100 cycles.	(a) See § IV 1a.
		(b) Check pickup for perfect vertical freedom and correct vertical pressure.
	3. Acoustic feed-back.	(a) The changer must be floated freely on the mounting springs according to the furnished template. When forwarding, secure the changer with cardboard props introduced between base plate and mounting board.
		(b) Lower the level of the pickup with an appropriate network not allowing this level to go beyond the point where distorsion appears in the amplifier and loudspeaker.
		(c) Lower the bass boost for a natural reproduction. For a crystal cartridge shunt the pickup with a 0.3 to 0.5 Meg. resistor.
V. Noise persists when pick-up is lifted from record.	(1) Incorrect pickup connection.	Check wiring of pickup.
	(2) Defective wiring.	Check pickup lead for a short or open lead.
	(3) Defective amplifier.	
	(4) Loose pickup cartridge terminal clips.	
	(5) Defective cartridge.	
VI. No sound during playing.	See § V.	
VII. Distorsion of recorded sound.	(1) Defective record.	Worn, dusty or defective records cause needle scratch and distort the recorded sound. Make a trial with a new and good recording.
	(2) Needle clogged by accumulation of dust.	Clean dust around needle tip.
	(3) Improper needle tip.	Verify that the proper needle tip is used for the type of records played.
	(4) Incorrect pickup weight or height.	
	(5) Incorrect matching of pickup to amplifier.	Verify that the radio set or amplifier is well adapted to the type of pickup cartridge. See pick-up cartridge wiring diagram.
	(6) Defective amplifier.	
	(7) Defective needle.	Check needle under microscope or try a new needle.
	(8) Defective cartridge.	Replace.
VIII. Control knob does not remain in the "START" position when starting the changer.	(1) Last Record Stop Lever (57) engaged on last record stop feeler.	After checking that Last Record Stop Feeler (15) on the platform is not free to move, grasp it with small pliers and lift it slowly until Last Record Stop Lever (57) is freed.

SYMPTOM	CAUSE	REMEDY
NOTICE: To start the changer, always hold control for one or two seconds in the "START" position.	(2) Last Record Stop Lever engaged on Stop Bracket (110).	Bring lever (57) in the position shown on Fig. 4.
Record Feeding Mechanism		
IX. Record does not drop when changer cycles.	(1) Record too thick.	Check for record thickness around center hole. Standard thickness is between .06" to .10". Exceptionally thicker records require a special spindle (part No. CD441).
	(2) Hole in record too large.	Check the diameter of hole in the record.
	(3) Overarm not properly lowered on record spindle.	Remove records from spindle. Start the changer and provoke a normal last record stop. Check then that overarm may be completely lowered on the record spindle. If hindered by record pusher (5), check turntable brake so that no overrun of the mechanism takes place.
	(4) Last Record Stop mechanism out of adjustment.	If changer overruns the regular stop position, first record may not drop. Check leather pad of Stop lever (69).
	(5) Record pusher (5) binding.	Remove record spindle (6) and check record pusher for perfect freedom of movement. Remove all foreign matter from pusher and lubricate slightly.
	(6) Record spindle out of position through accumulation of dirt in center hole of turntable spindle or bent.	See § III Nos. 3 and 4.
	(7) Record pusher (5) out of adjustment.	With a record on the spindle step, start the changer, maintaining by hand the speed of the turntable very slow. Then verify that record pusher (5) moves out first far enough to push the record from the spindle step. Adjust at point (A1), shown on exploded view. CAUTION: Adjustment must be made in the direction for increasing protrusion of pusher. If protrusion is already too large, first decrease it largely, then increase slowly to the right position. Check result during several cycles of changer.
	(8) Record ejector lever (43) binding.	Record ejector lever (43) must be perfectly free on its two end connections. Stop changer in the regular Last Record Stop position and move manually the ejector lever. This lever must be energically brought back into rest position by coil spring (58). If binding, see that base plate of changer has not been bent or is not distorted by the mounting device. Adjust carefully lever (43) by bending.
	(9) Record Selector shaft (10) binding.	Record Selector shaft (10) must turn freely in the bearings of the platform. Lubricate and, if necessary, remove shaft from platform. For this operation proceed as follows: (a) Remove the two nuts (109), spring (108), and parts (102), (103), (104), (105) and (106).

SYMPTOM	CAUSE	REMEDY
		(b) Mark ejector lever crank (101) and shaft (10) with a tracing point to allow for exact positioning when mounting again. (c) Loosen set screws (100) of ejector lever crank (101). (d) Take away the two stop screws (11) of overarm and bring overarm in vertical position. Take away the two nuts and pivoting screws (2) and (3) of overarm to allow withdrawal of shaft (10). (e) File off burrs and rough surfaces. Polish and lubricate. If bent, replace Record Selector Shaft.
X. Two records drop at once.	(1) Hole in record too large.	Check the diameter of the hole. Eliminate worn or split records.
	(2) Record too thin.	Check for record thickness around center hole. (Use special gauge 01526.) Records thinner than .06" at center may jam the feeding mechanism and wear out prematurely.
	(3) Record pusher out of adjustment.	See § IX Nos. 4, 5 and 6.
XI. Premature wear around center hole of record.	(1) Loading operations roughly made.	Records must be placed carefully on the record spindle. mixed records of different diameters are advantageously loaded one by one on the spindle. Do not allow records to take an inclined position on the spindle.
	(2) Non standard records.	See § IX and X.
	(3) Feeding mechanism out of adjustment.	See § IX and X.
XII. Record hits pickup arm when dropping.	(1) Record too thick or too thin.	See § IX Nos. 1 and 2, and § X Nos. 1 and 2.
(Delay in record dropping).	(2) Record pusher out of adjustment, or binding.	See § IX Nos. 3 to 8.
Pickup Arm Adjustment		
XIII. Minor unadjustment in needle set down about 10" and 12" positions.	(1) Incorrect adjustment of adjusting screw (22).	First, verify that control is correctly set on 10"-12". Place a 10" record on the turntable and start the changer. Stop it with the pickup in playing position. With a screwdriver adjust screw (22) through hole (A4) (Fig. 2). Clockwise to move pickup in. Counterclockwise to move pickup out. If pickup control arm (21) has not been bent, the set down on 12" is correct when properly adjusted for 10".
	(2) Pickup control arm (21) bent.	When adjustment of set down through screw (22) is impossible, pickup control arm (21) has been bent. If badly bent, replace the whole control arm.
XIV. Difference in needle set down between first and last record of a stack.	Pickup control arm (21) bent.	If a compromise set down may not be realized through screw (22), check pickup control arm as above.

TROUBLE CHART - Con't.

SYMPTOM	CAUSE	REMEDY
XV. Correct set down for 10" and 12" records, but minor unadjustment for 7" records.	Incorrect adjustment of 7" abutment lever (95).	First, check for exact set down for 10" and 12" records, then regulate 7" set down by bending ear (H) of abutment lever (95).
XVI. No 7" set down or no 10" set down.	7" control binding or bent.	Start the changer, after a regular last record stop, and stop it just after one complete revolution only of the turntable. Stud of set down control cam (47) must be entirely disengaged from 7" abutment lever (95). Actuate 7" control knob and check switch mechanism for perfect freedom. Stud must come in and out of path of abutment lever for respectively 10" - 12" and 7" positions of control knob.
XVII. Pickup abruptly jumps towards center of record after having set down on 12" record.	(1) Overarm remained in loading position.	When loading the records on the spindle, the arm (4) for Last Record Stop is engaged by the stop ring (9) on Record Selector shaft (10). For correct functioning of cycle mechanism, disengage arm (4) by lowering overarm.
	(2) Record Ejector lever (43) binding.	See § IX 8 .
	(3) Record Selector shaft (10) binding.	See § IX 9 .
	(4) Landing Position cam (88) out of adjustment.	See § XVIII 4 and 8 .
XVIII. Needle sets down on 10" for 12" records or inversely.	(1) Single record operation.	When a record is put directly on the turntable without having been dropped from the record spindle, the pickup will set down on 10" diameter, irrespective of the diameter of this record. To play a single 12" record, either put it on the record spindle, or place it directly on the turntable, pressing with a finger on the index feeler (16) during the beginning of the cycle.
	(2) Record dropping late from record spindle.	See § XII 1 and 2 .
	(3) Selector Feeler (16) on the platform binding or stuck.	The feelers on the platform should not be oiled. When stuck through oil or dirt, put Naphta on the feelers through platform split until they become perfectly free to move and return to their upper rest position when depressed.
	(4) Selector latch (115) binding or bent.	Selector latch must be freely pivoting on pin (111) and submitted only to the light friction of spring washer (113).
	(5) Record Ejector Lever (43) binding.	See § IX 8 .
	(6) Record Selector Shaft (10) binding.	See § IX 9 .
	(7) Selector Link (89) binding or bent.	Selector link must be perfectly free on its connections to both cams (104) and (88) and sufficient play must be present in those connections.
	(8) Landing Position Cam (88) out of adjustment.	First, check the functioning with 10" records. Selector feeler (16) being out of reach of record edges must remain in upper rest position and Selector Latch (115) out of engagement with the notch (E) of Selector cam (104) during the snap back action of Record Ejector Lever (43).

SYMPTOM	CAUSE	REMEDY
		Functioning with 12" records. When dropping from the record spindle, 12" records push Selector feeler (16) down, thus holding Selector latch (115) in position for engagement with notch (E) of selector cam (104). The tone arm actuating lever (97) must then contact landing position cam (88) at point (F). If necessary, adjust this by slightly loosening the screws on the selector link (89). IMPORTANT: The engagement between Selector latch (115) and Selector cam (104) is only maintained while the pickup is landing. Before the cycling is completed, Record Ejector lever (43) snaps back crank (101), and pin (I) of ejector lever crank (101) disengages selector latch (115) from notch (E) of the selector crank (104).
XIX. Needle always sets down on 12" for single record operation or last record of the stack.	Arm for Last Record Stop (4) out of adjustment.	Arm (4) must contact only the Last Record Stop feeler (15) when there are no records on the record spindle, and be out of contact with Selector feeler (16). If arm (4) is out of form, adjust it by bending carefully at point (J).
Clutch Mechanism		
XX . Changer continues to cycle for 10" or 12" records. For 7" records only, see § XXIII.	(1) Reject mechanism binding.	Clutch Stop lever must be perfectly free on its pivoting axis under the action of spring (73) and must be free from oil or grease. Check that lever (61) is out of contact with Clutch Stop lever when control is not on Reject position.
	(2) Clutch plate binding or bent.	When Clutch Stop lever is in the reject position, the clutch plate must be perfectly free to move under the action of spring (74). Oil or grease between Upper Mechanism plate (52) and Clutch plate may impare this freedom of movement.
	(3) Changer mechanism binding.	When a too great force is required to cycle the changer, the clutch plate may be unable to disengage Clutch pinion gear (53) from drive gear (83). Check mechanism for normal freedom of all parts; actuation of cycle must be possible without effort when turning cycling cam (91) counterclockwise with the hand. If binding occurs, check for foreign matter in the gear teeth or bent parts. Straighten or replace. Clean and lubricate.
Auto-trip Mechanism		
XXI . Changer does not cycle when record has been played.	(1) No finishing trip groove on record.	
	(2) Needle jumps out of grooves in record.	(a) Check pickup height. With a too high pickup adjustment, the needle will not track properly until the end of the first record.
		(b) Check pickup pressure on the record.
		(c) Needle clogged by accumulation of dust or worn.
		(d) The record may be defective; check with a record that is known to be good.
		(e) Trip Lever Actuating Fork (63) binding or bent.

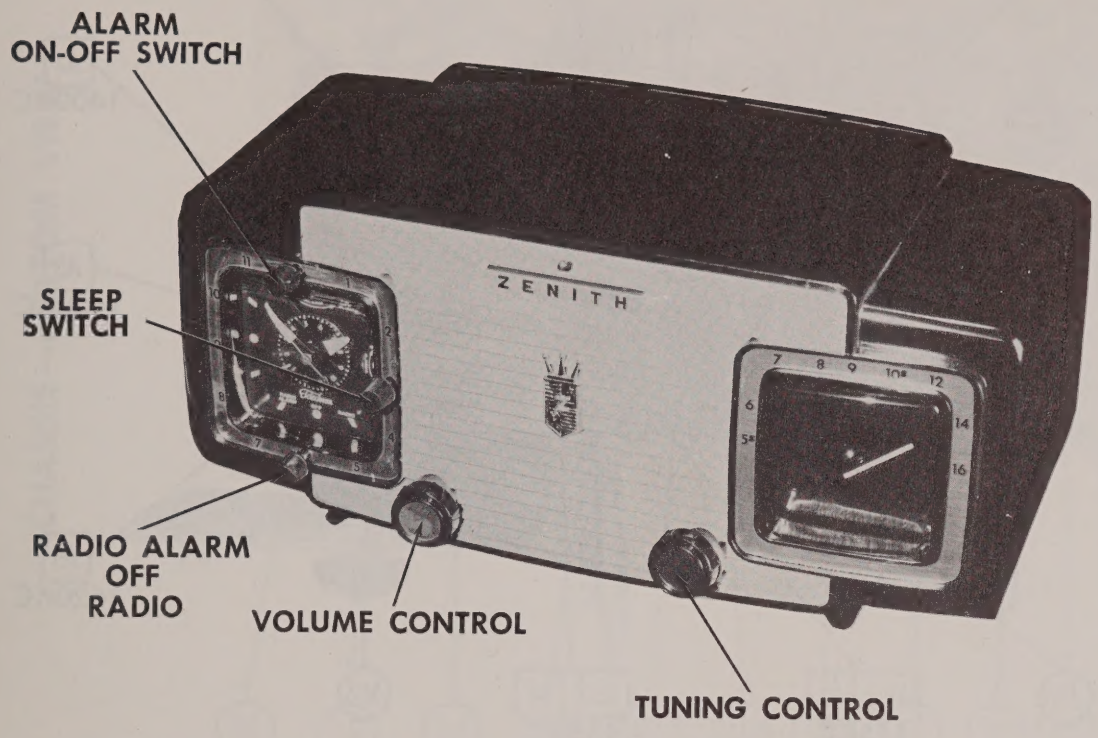
TROUBLE CHART - Con't.

SYMPTOM	CAUSE	REMEDY
	(3) Trip lever (70) binding.	The friction between Trip Lever Actuating Fork (63) and trip lever (70) does not depend on a spring and is not adjustable. It is thus essential that trip lever does not touch any other part than Fork (63) and Clutch Stop lever. Check that no foreign matter or grease is lodged between Trip lever and Upper Mechanism plate.
	(4) Trip Catch binding or out of normal position.	The Trip Catch must be perfectly free to move on the pivoting pin on Trip lever (70). Check that spring (72) brings back Trip Catch against abutment of Trip lever when slightly displaced. There must be no oil or grease on these parts. Trip Catch must touch Clutch Stop lever only on bent part and not on horizontal surface. Adjust by carefully bending Trip lever (70). IMPORTANT: Don't modify the original adjustment of arm on Trip Catch.
	(5) Trip lever (70) out of adjustment.	Bent extremity L of Trip lever (70) allows an adjustment of sensitivity of auto trip mechanism. Bending outside diminishes and bending inside increases this sensitivity.
	(6) Clutch Stop lever binding.	See § XX 1.
	(7) Changer mechanism binding.	If Reject control does not operate, see § XXII 3).
XXII. Changer trips before needle reaches end of record.	(1) Hole in record too large.	If the hole in the record is too large, the groove may turn eccentric with the spindle and cause premature tripping.
	(2) Trip lever (70) out of adjustment.	If sensitivity of auto trip mechanism is too great, adjust by slightly bending extremity L of Trip lever (70) outside of lever.
XXIII. Changer trips at the beginning of 7" records.	Auto trip mechanism operating on a too large diameter.	Pin on Pickup Control Arm (21) cooperates with Trip Lever Actuating Fork (63) to actuate auto trip mechanism. Bent slightly pin in the proper direction after having checked that arm (21) is not bent. See § XIII No. 2.
Last Record Stop Mechanism		
XXIV Changer stops instead of repeating single or last record.	Repeat control crank (41) out of adjustment.	Introduce a screw driver in notch K of repeat crank (41) and increase slightly its width to obtain a better locking action when in repeat position.
XXV. Changer stops before last record has been played.	(1) Arm for Last Record Stop (4) out of adjustment.	See § XIX.
	(2) Last Record Stop feeler (15) on the platform binding or stuck.	See § XVIII 3.
XXVI. Changer does not stop after last record has been played.	(1) Last Record Stop feeler (15) binding or stuck.	See § XVIII 3.
	(2) Last Record Stop lever (57) out of adjustment.	Lever (57) must be free to move under the action of spring (56). Press on feeler (15) and check that the extremity of lever (57) is stopped by this feeler when the changer is cycling, at the moment where the tone arm is out. For this adjustment bring tone arm in playing position and loosen slightly the two screws on lever (57); then tighten again.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	CD. 385	Overarm	66	A. 127	Switch Cover
2	M5VSM12699	Nut, Overarm Mounting		A. 130	Switch Contact Springs
3	CD. 122	Screw, Overarm Mounting	67	VSM12156	Screw, Switch Cover Mounting
4	CD. 265	Last Record Stop Arm	68	CD. 138	Brake Spring
5	CD. 279	Record Push Lever	69	CD. 345	Switch & Brake Bracket
6	DE. 270	Spindle (complete)	70	CD. 571	Trip Lever
7	CD. 1640	"C" Washer	71		Upper Control Plate Mounting Spacers
8	CD. 111	Record Selector Roller			
9	CD. 275	Stop Ring	72	CD. 929	Trip Spring
10	CD. 295	Record Selector Shaft	73	CD. 240	Clutch Stop Lever Pivot Spring
11	M4X6/3F. 42	Stop Screw for Overarm	74	CD. 163	Clutch Plate Spring
12	CD. 277	Overarm Platform	75	2XM23X4F38	Set Screw for Reject Rod Collar
13	CD. 115	Pin for Mounting Springs 14	76	CD. 1606	Reject Rod Adjusting Collar
14	CD. 136	Overarm Tension Springs	77	CD. 1637	Reject Rod
15	CD. 293	Stop Feeler	78	CD. 403	Pause Lever
16	CD. 402	Selecting Feeler	79	CD. 352	Pinion Gear & Star Wheel Assembly
17	PU. 690	Tone Arm			
18	PU. 693	Tone Arm Pressure Spring	80	CD. 233	Pause Cam
19	CD. 274	Tone Arm Rest Spring	81	CD. 240	Pause Cam Tension Spring
20	CD. 1574	Height Adjustment Bracket	82	CD. 351	Main Drive Gear
21	CD. 59	Tone Arm Control Lever	83	CD. 349	Pause Gear
22	CD. 72	Screw, Set-Down Adjusting Stud	84	CD. 405	Lower Control Plate
			86		Switch Mounting Bracket
23	PT. 30	Turntable	87		Muting Switch
24	M3X12F. 26	Screws, Tone Arm Mounting Base Cover	88	CD. 155	Landing Position Cam
			89	CD. 11	Selector Link
25	CD. 64	Tone Arm Mounting Base Cover	90	CD. 254	Main Cam Spacer Washer
			91	CD. 353	Main Cam
26	M4X55F48	Set Screws, Control Knob Mounting	92		Cam Lever
			93	CD. 63	Cam Lever Retaining Bracket
27	M4X7F1	Screws, Upper Control Plate Mounting	94	GI. 38	7" Abutment Lever Tension Spring
28	F. 1034	Nuts, Motor Mounting	95	CD. 316	7" Abutment Lever
29	CD. 27	Control Knobs	96	CD. 56	Lift Bracket
30	F. 1039	Flat Washer, Fiber	97	CD. 309	Tone Arm Actuating Lever
31	CD. 415	Baseplate	98	CD. 213	Tone Arm Actuating Lever Spring
32		Control Panel Escutcheon			
33	F37	Screw, Speed Control Escutcheon Mounting	99		Fiber Washer
			100	M3. 5X8. 5F. 38	Set Screws, Ejector Lever Crank
34	ME. 94	Speed Control Escutcheon			
35		Screw, Control Shaft Mounting Plate	101	CD. 333	Ejector Lever Crank
			102	CD. 214	Clutch Washer, Fiber
36		Control Shaft Mounting Plate	103	CD. 99	Clutch Washer, Metal
37	GI. 63	Repeat Lever Spring	104	CD. 97	Selector Crank
38	CD. 317	Reject Actuating Arm	105	CD. 214	Clutch Washer, Fiber
39	CD. 319	Spacer	106	F1040	Flat Washer
40	F. 1041	Flat Washers	107		Speed Adjustment Lever
41	CD. 334	Repeat Control Crank	108	CD. 137	Coil Spring
42		Pause & Reject Control Crank	109	M6VSM12699	Hex Nut
43	CD. 400	Record Ejector Lever	110	CD. 205	Last Record Stop Lever Guide Plate
44	F. 1040	Flat Washer			
45		Start & Stop Control Crank	111	CD. 296	Selector Pivot Pin
46	GI. 14	Start & Stop Crank Spring	113		Spring Washer
47	CD. 399	7", 10" & 12" Set-Down Positioning Cam & Stud	114	F. 1096	Flat Washer, Fiber
			115	CD. 100	Selector Latch
48	CD. 398	Set-Down Position Actuating Cam	116	F. 1096	Flat Washer, Fiber
			117	ME. 578	"C" Washer
49	CD. 321	Spring	118		Speed Adjustment Lever Adjusting Screw
50	GI. 38	Spring			
51	M3. 5X7F37	Screw, Overarm Platform Mounting	119		Spring Washer
			120		Flat Washer Fiber
52	CD. 425	Upper Control Plate	121	CD. 412	Speed Adjusting Link
53	CD. 257	Clutch Pinion	122		"C" Washer
54	M4X6F. 7	Screw, Clutch Pinion Mounting	123		Flat Washer
55	CD. 130	Clutch Actuator Lever	124		Compression Spring
56	GI. 38	Stop Lever Spring	125		Drive Gear Retainer
57	CD. 297	Last Record Stop Lever	126	CD. 32	Drive Gear Striker Pad, Leather
58	CD. 322	Record Ejector Lever Spring			
59	CD. 150	Stop Lever	127	ME. 42	Motor Control Cam
60		Start Link (Part of item 45)	128	CD. 40	Drive Gear
61	CD. 313	Reject Lever	129	ME. 132	Voltage Adjusting Screw
62	CD. 323	Reject Lever Return Spring	130	DE. 269	Motor, Complete
63	CD. 251	Trip Lever Actuating Fork	131	ME. 96	Bracket for Speed Lever
64	CD. 344	Repeat Stop Lever	132	ME. 97	Speed Selector Abutment Cams
65	CD. 133	Clutch Actuator Lever Spring			

ZENITH
MODELS L622, F, G, W (Ch. 6L03)



ZENITH
MODELS L622, F, G, W (Ch. 6L03)

TRADE NAME	Zenith Models L622, F, G, W (Ch. 6L03)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (Six)	Types 6BJ6 RF Amp., 12BE6 Conv., 6BJ6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alginment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Set tone control for maximum treble.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	455KC (400∿Mod.)	600KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	Tuning gang fully open	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6, A7	"

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PARTS LIST AND DESCRIPTIONS

ZENITH MODEL L622

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		ZENITH PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BJ6	6BJ6	7CM	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amplifier	6BJ6	6BJ6	7CM	
V4	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
V5	Audio Output	50C5	50C5	7CV	
V6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■80	150	22-2351	AFH2-19		BO18		FP216	TVL-2442	
B	▲40	150								
C2	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	4TM-S5	
C3	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	4TM-S5	
C4	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C5	4000		22-4	BPD-004	D6-402	TM5D4	822-004	UC-524	5HK-D4	
C6	470		22-6	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C7	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C8	.01	400	22-1182	P488-01	D6-103	PTE4S1	811-01	PT411	4TM-S1	
C9	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C10	.05	200	22-829	P288-05		PJ2S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	63-2826	Q13-133	AG-60-Z	BSK-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	63-2830	Q13-133	AG-60-Z	B-60	U-48	Tone
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R3	330Ω	½	63-1765	BTS-330	
R4	15KΩ	½	63-1835	BTS-15K	
R5	1000Ω	½	63-1786	BTS-1000	
R6	22KΩ	½	63-1842	BTS-22K	
R7	68Ω	½	63-1737	BTS-68	
R8	2.2Meg	½	63-1926	BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R9	4.7Meg	½	63-1940	BTS-4.7Meg	
R10	470KΩ	½	63-1898	BT-470K	
R11	470KΩ	½	63-1898	BTS-470K	
R12	150Ω	1	63-1977	BTA-150	
R13	1000Ω	1	63-965	BTA-1000	
R14	22Ω	1	63-1450		

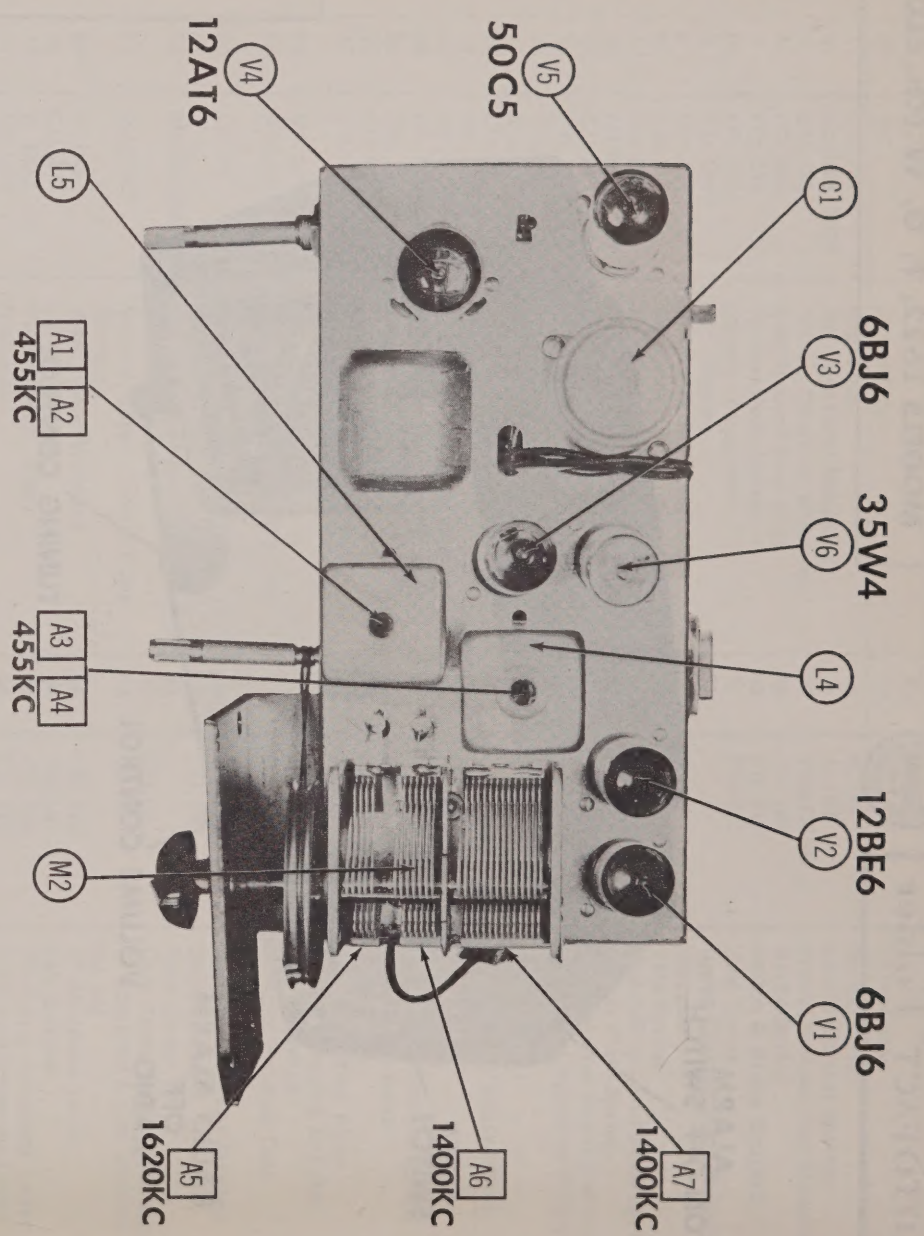
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.6KΩ	3.3Ω	193Ω tap ⓐ 6Ω	.64Ω	95-1293	A-3849 ①	A-3031 ①	RO-3 ①	S-1X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	49-713	ST-113 Mod. P4-X	4A07	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

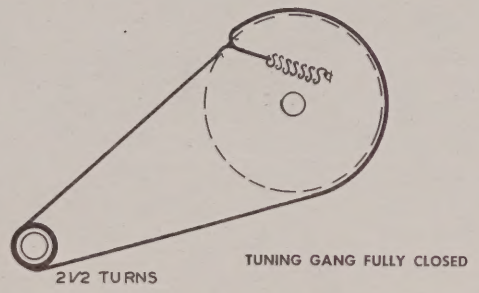
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2.5Ω		S-19532				Part of cabinet back
L2	RF Coil	3.2Ω	11Ω	S-18500				Sec. tapped @ 6.5Ω
L3	Osc. Coil	.7Ω	9.5Ω	S-18501			69-Osc.	
L4	Input IF	17Ω	16Ω	95-1101	16-6666	BC-368	012-C1	
L5	Output IF	23Ω	23Ω	95-1102	16-6770 *	BC-355 *	12-C6 *	

* Use adaptor plate and cut out center spade bolt mounting support.

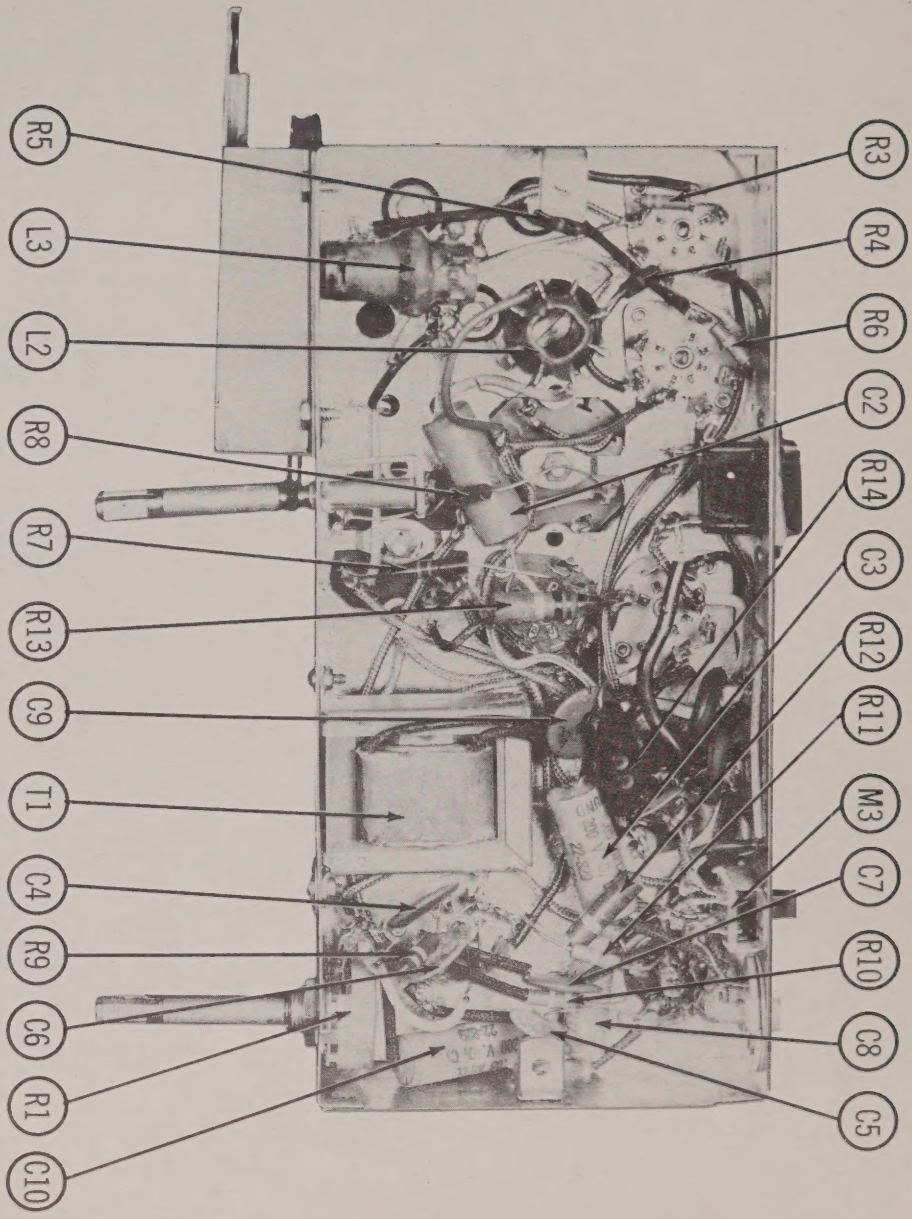
MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M1	Dial Light	100-67	Type #47
M2	Tuning Cap.	22-2352	35-477MMF, 17-232MMF, 14-152MMF
M3	Switch	85-495	Radio-Phono Selector
	Clock Assy.	S-19224	Model L622G
	Clock Assy.	S-19225	Model L622W
	Clock Assy.	S-19226	Model L622
	Clock Assy.	S-19227	Model L622F
	Cabinet	14-1474	Model L622G
	Cabinet	14-1475	Model L622W
	Cabinet	14-1476	Model L622
	Cabinet	14-1477	Model L622F
	Dial Scale (Radio)	26-480	
	Dial Scale (Clock)	26-481	
	Pointer	59-282	Model L622
	Pointer	59-280	Models L622F and L622G
	Pointer	59-281	Model L622W
	Dial Glass	192-155	Clock and Radio (2 Used)
	Knob	46-904	Clock, Model L622 (3 Used)
	Knob	46-951	Clock, Model L622F (3 used)
	Knob	46-985	Clock, Model L622G (3 used)
	Knob	46-940	Clock, Model L622W (3 used)
	Knob	46-943	Volume and tuning, Model L622 (2 used)
	Knob	46-950	Volume and tuning, Model L622F (2 used)
	Knob	46-1025	Volume and tuning, Model L622G (2 used)
	Knob	46-942	Volume and tuning, Model L622W (2 used)
	Knob	46-1077	Tone, Model L622
	Knob	46-1078	Tone, Model L622F
	Knob	46-1075	Tone, Model L622G
	Knob	46-1076	Tone, Model L622W

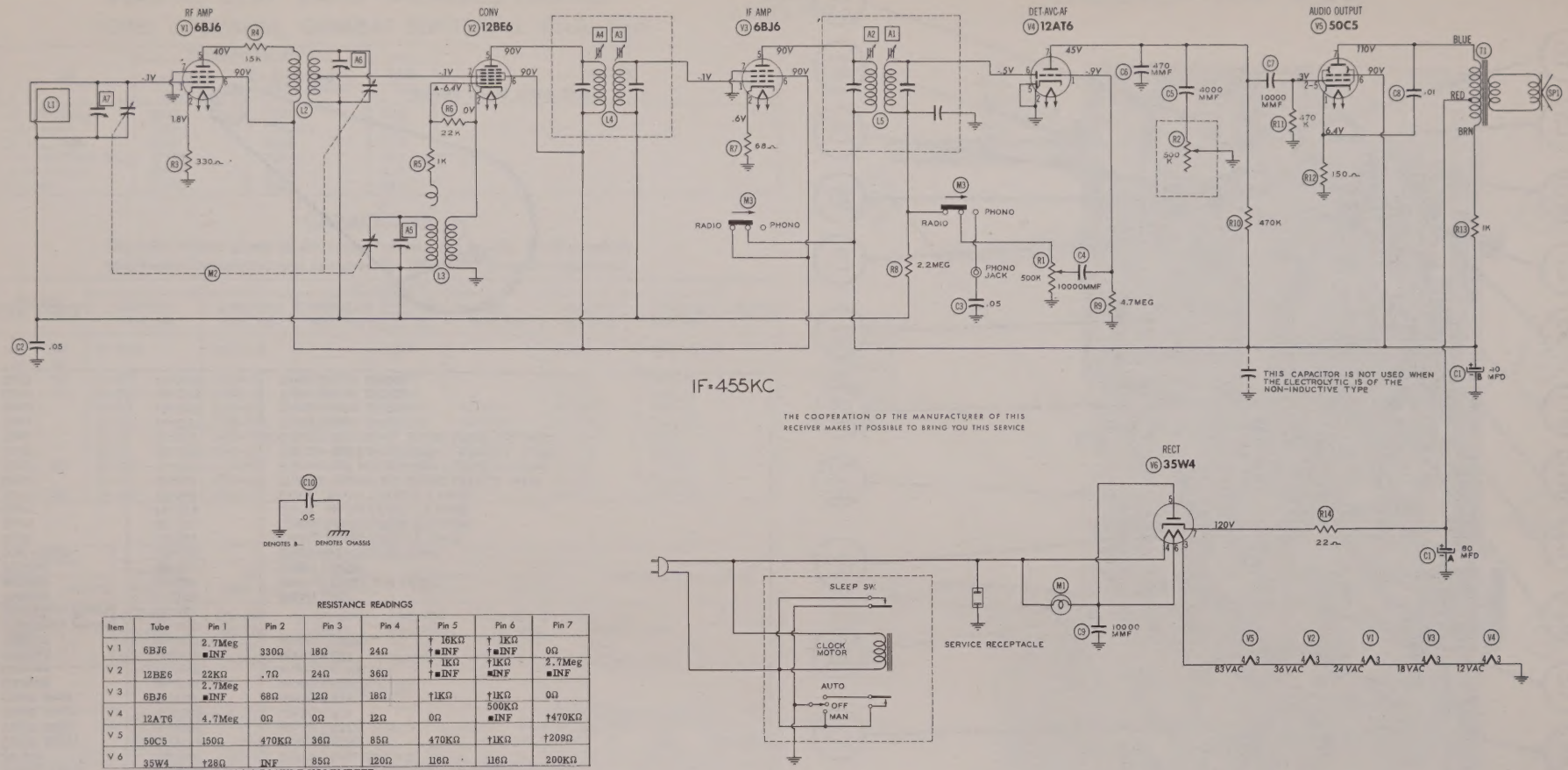


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



ZENITH MODEL L622



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BJ6	2.7Meg ■INF	330Ω	18Ω	24Ω	† 16KΩ †■INF	† 1KΩ †■INF	0Ω
V 2	12BE6	22KΩ	.7Ω	24Ω	36Ω	† 1KΩ †■INF	†1KΩ ■INF	2.7Meg ■INF
V 3	6BJ6	2.7Meg ■INF	68Ω	12Ω	18Ω	†1KΩ	†1KΩ	0Ω
V 4	12AT6	4.7Meg	0Ω	0Ω	12Ω	0Ω	500KΩ ■INF	†470KΩ
V 5	50C5	150Ω	470KΩ	36Ω	85Ω	470KΩ	†1KΩ	†209Ω
V 6	35W4	†28Ω	INF	85Ω	120Ω	116Ω	116Ω	200KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V6
ALL MEASUREMENTS TAKEN IN "RADIO" POSITION UNLESS OTHERWISE SPECIFIED
■ MEASURED IN "PHONO" POSITION

PHOTOFACT STANDARD NOTATION SCHEMATIC
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1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.